RCRA Facility Investigation – Remedial Investigation/ Corrective Measures Study – Feasibility Study Report for the Rocky Flats Environmental Technology Site

Section 5.0
Nature and Extent of Surface Water and Sediment Contamination

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5.0 NATURE AND EXTENT OF SURFACE WATER AND SEDIMENT CONTAMINATION

This section defines the nature and extent of surface water and sediment contamination. Under the Resource Conservation and Recovery Act/Colorado Hazardous Waste Act (RCRA/CHWA), the facility owner/operator is required to collect and present all information necessary to allow it and the Colorado Department of Public Health and Environment (CDPHE) to characterize the release and evaluate the risks to human health and the environment (CDPHE 2002, Section 2.3).

Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the final objective of the field investigations is to characterize the nature and extent of contamination such that informed decisions can be made as to the level of risk presented by the site and the appropriate type(s) of remedial response (EPA 1988, Section 3.2.4).

Remediation goals establish acceptable exposure levels that are protective of human health and the environment (40 Code of Federal Regulations [CFR] 430 [e][2][i]). The 1×10^{-6} risk level shall be used as the point of departure for determining remediation goals for alternatives when applicable or relevant and appropriate requirements (ARARs) are not available or are not sufficiently protective because of the presence of multiple contaminants at a site or multiple pathways of exposure (40 CFR 430 [e][2][i][A][2]). At this point in the RCRA/CERCLA process at Rocky Flats, remediation goals are termed preliminary remediation goals (PRGs). PRGs are calculated in accordance with the Comprehensive Risk Assessment (CRA) Methodology and are contained in Appendix A of the CRA Methodology.[1]

Ecological screening levels (ESLs) are not used to define the extent of contamination in the Remedial Investigation (RI). While both RCRA/CHWA and CERCLA require information necessary to characterize the release and evaluate risks to human health and the environment, no RCRA/CHWA or CERCLA regulation or guidance requires a screen to an ESL concentration to define the extent of contamination. Comparison of surface water and sediment data to ESLs is provided in the CRA.

A comparison of the RI-ready data to ESLs or PRGs is provided in Appendix A, Volume 2, Attachment 3:

[1] The Wildlife Refuge Worker (WRW) PRGs are human health screening levels developed for noncarcinogenic effects using a hazard quotient (HQ) of 0.1 or for carcinogenic effects based on a target risk of 1×10^{-6}. The more conservative of the two values is used for the WRW PRG. An HQ is based on a single contaminant while a hazard index (HI) is based on the summation of HQs of multiple contaminants. For the purpose of developing chemical-specific PRGs, the RFCA Parties agreed to base the noncarcinogenic PRG on an HQ of 0.1 to account for potential cumulative effects of multiple contaminants (DOE 2005a). These values are used for analyte of interest (AOI) screening in the nature and extent evaluations.

- Surface soil/surface sediment – Exposure Unit (EU) overlay and PRG comparison: Figures A3.9 through A3.16;
- Surface water – EU overlay and PRG comparison: Figures A3.25 through A3.32;
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- Surface water – AEU overlay and ESL comparison: Figures A3.49 through A3.56; and
- Subsurface soil/subsurface sediment – EU overlay and PRG comparison: Figures A3.65 through A3.72.

5.1 Introduction

The nature and extent of surface water and sediment contamination presented in this section was evaluated in accordance with RI/Feasibility Study (FS) Work Plan Task 11. Accordingly, this section summarizes the types of contaminants present in surface water and sediments at the site, as well as their distribution in the four drainages, Woman Creek, North Walnut Creek, South Walnut Creek (and tributaries thereto), and Lower Smart Ditch. Groundwater and surface soil sources for the contamination are depicted. As appropriate, results from the Site-Wide Water Balance (SWWB) and the Actinide Migration Evaluation (AME) are included to support demonstration of compliance with surface water quality standards.[2] The nature and extent of surface water and sediment contamination discussion includes figures that portray the distribution and migration of contaminants in surface water at the site (DOE 2002a).

The purpose of this section is to define the nature and extent of surface water and sediment analytes of interest (AOIs) at the Rocky Flats Environmental Technology Site (RFETS or site). Per agreement with the RFCA Parties, surface water AOIs are those analytes that are present above the background mean plus two standard deviations (M2SD) and have greater than a 1 percent frequency of detection above the surface water standard[3] or practical quantitation limit (PQL) if greater than the standard. Sediment AOIs are those analytes that are present above the background M2SD and have greater than a 1 percent frequency of detection above the PRGs for a wildlife refuge worker (WRW) based on a target excess carcinogenic risk of 1×10^{-6} or a hazard quotient (HQ) of 0.1. Surface water and sediment AOIs are evaluated in Section 8.0.

[2] Discussed in Section 8.0, Contaminant Fate and Transport.

[3] Elimination of less-than-1-percent-frequency analytes is based on application of Colorado's guidance on data requirements and interpretation methods used to establish existing water quality in Colorado Water Quality Control Commission (CWQCC) rulemaking proceedings (CWQCC 1993, 2004, 2005). See Section 5.5.1 for the source of surface water quality standards for RFETS.

Data used in this section are the result of previous investigations conducted at the site, from sitewide sampling programs, samples collected after accelerated actions were implemented, and data collected during the sitewide RI/FS. Given that water quality and chemical loading conditions are dynamic and affected by variables such as site releases, accelerated action efforts, flow, and so forth, it was determined that data reflective of more current conditions are representative of surface water quality for the evaluation of AOIs. Therefore, the surface water nature and extent is based on data collected between January 1, 2000, and July 31, 2005. The sediment nature and extent is based on data collected between June 28, 1991,[4] and July 31, 2005.

A brief chronology of surface water and sediment monitoring at RFETS is presented below to provide a historical perspective of surface water and sediment characterization and monitoring at the site.

5.2 Surface Water and Sediment Monitoring at RFETS

Surface water monitoring has been conducted at RFETS throughout the site's history, from 1952 to the present. Surface water and sediment data were collected under numerous investigations and included analyses for radionuclides, metals, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), pesticides, herbicides, dioxins (sediment only), and water quality parameters (including inorganics). Data were initially collected for effluent monitoring of Plant releases and reservoir and drinking water monitoring. Subsequently, surface water and sediment data have been reported in numerous RFETS reports and were warehoused in the Rocky Flats Environmental Database System (RFEDS) and its successor, the Soil Water Database (SWD). Table 5.1 provides a summary of surface water and sediment monitoring locations and sampling frequencies. Surface water data have been collected from 404 locations (Figure 5.1) and sediment data from 369 locations (Figure 5.2) in four drainage basins (Figure 5.3) that include Rock Creek, Walnut Creek (including the McKay Ditch), Woman Creek, and Lower Smart Ditch since June 28, 1991.

Past data were collected under a variety of programs. These programs included, but were not limited to:

- Sitewide characterization (for example, Operable Unit [OU] RCRA Facility Investigations [RFI]/RIs);
- Accelerated actions and interim measures/interim remedial actions (IM/IRAs);
- National Pollutant Discharge Elimination System (NPDES) sampling;
- Event-related surface water monitoring;
- Automated surface water monitoring;

[4] This date correlates to approved work plans and Sampling and Analysis Plans (SAPs) developed pursuant to the 1991 Interagency Agreement (IAG).

- Ponds A-4, B-5, and C-2 predischarge sampling;
- Former Building 891 treatment facility effluent monitoring;
- Incidental waters;
- Remediation projects;
- Groundwater treatment system effluent monitoring; and
- Other special projects.

An Integrated Monitoring Plan (IMP) is required under the Rocky Flats Cleanup Agreement (RFCA) to implement environmental media monitoring programs at the site and serves as the current surface water and sediment monitoring plan for RFETS. The IMP outlines the monitoring goals for surface water and sediment and describes the various components of the surface water and sediment monitoring program. The IMP, originally published in May 1997, replaced the numerous permit, event-related, and characterization surface water monitoring programs conducted at the site. Since Fiscal Year (FY) 2004, the IMP has been updated quarterly (as needed) and annually to reflect periodic changes to the monitoring programs.

IMP updates include input derived from consultation with the regulatory agencies (EPA and CDPHE), cities, and stakeholders. This consultative process determined the locations of new monitoring wells, analytical suites for new and existing monitoring wells, well abandonment and replacement, and the overall design of the current monitoring network. Regulatory agency and community input was obtained by DOE, and DOE strategies were transmitted to the communities through quarterly information exchange and Water Working Group meetings. In addition, IMP meetings were frequently scheduled to address the evolving nature of the IMP as the site moved toward closure. City and stakeholder participants included, but were not limited to, representatives of the City and County of Broomfield, City of Arvada, City of Westminster, City of Northglenn, City of Thornton, Rocky Flats Coalition of Local Governments (RFLCOG), and Rocky Flats Citizens Advisory Board (RFCAB).

The IMP was developed to guide the majority of surface water monitoring at RFETS. The IMP was developed using the EPA data quality objective (DQO) process. The DQO process is a structured decision-making process that requires the identification of and agreement on decisions for which data are required. This process resulted in multiple surface water monitoring objectives detailed in the IMP. Although surface water data were collected outside of the IMP by special projects prior to physical completion, much of the surface water monitoring at the site since October 1996 has been covered by the following objectives:

- Source location monitoring to identify potential new sources;

- Ad hoc monitoring for special temporary projects such as the AME, SWWB, agency studies (for example, CDPHE uranium high-resolution inductively coupled plasma/mass spectrometry [ICP/MS] study), and operational monitoring (for example, footing drain monitoring);
- Indicator parameter monitoring to provide information for special data assessment;
- Incidental waters monitoring to facilitate proper disposition of water collected in utility pits, excavations, secondary containment, and so forth;
- Sanitary system monitoring including:
  - Internal wastestream characterization to characterize routine internal wastestreams to meet NPDES permit requirements
  - Monitoring discharges to the Wastewater Treatment Plant (WWTP) to determine authorization for nonroutine wastestreams to be discharged to the WWTP
  - WWTP collection system protective monitoring to ensure inflows will not disrupt proper WWTP operation;
- WWTP collection system flow monitoring to evaluate for abnormal conditions
  - CDPHE WWTP influent radiological and metals monitoring to track loads and concentrations;
- Performance monitoring of specific projects to ensure effectiveness of administrative and engineering controls (for example, erosion controls);
- Performance monitoring for the Mound Site, East Trenches, and Solar Pond Plume Treatment Systems;
- NPDES permit monitoring as specified by the permit;
- New source detection monitoring to evaluate for statistically significant changes in water quality for water leaving the Industrial Area (IA) and entering the site retention ponds;
- Stream segment 5/Point of Evaluation (POE) monitoring to evaluate a specific set of constituents against RFCA action levels (ALs), specifically for locations GS10, SW027, and SW093;
- Predischarge monitoring to confirm that retained pond waters meet stream standards prior to discharge;

- Stream segment 4a/4b Point of Compliance (POC) monitoring to evaluate selected constituents against RFCA ALs, specifically for locations GS01, GS03, GS08, GS11, and GS31;
- Non-POC monitoring at Indiana Street to provide supplemental data to CDPHE;
- Uncharacterized discharge monitoring that is only required when other monitoring is not performed due to unusual conditions such as extreme flood events (similar to ad hoc monitoring);
- Community assurance off-site monitoring; and
- Buffer Zone (BZ) hydrologic monitoring in support of watershed and ecological health evaluation.

5.3 Surface Water and Sediment Data

Data used to evaluate the nature and extent of surface water and sediment contamination were obtained from:

- Previous investigations conducted at the site prior to and under RFCA;
- Routine surface water monitoring under RFCA; and
- Surface water and sediment samples collected to evaluate the performance of RFCA accelerated actions.

Surface water and sediment data for RFETS were collected in accordance with agency-approved Sampling and Analysis Plans (SAPs),[5] the IMP, and standardized contract-required analytical procedures. Approved Work Plans and SAPs specified the use of EPA-approved sampling procedures and analytical methods, data quality requirements, and data management processes, and specified the appropriate DQOs.[6] The surface water nature and extent evaluation is based on data collected from January 1, 2000, through July 31, 2005. The sediment nature and extent evaluation is based on data collected from June 28, 1991,[7] through July 31, 2005.

[5] Pursuant to the 1991 IAG, RFI/RI Work Plans and SAPs were prepared for 16 OUs that existed at that time (1991-1996). Between 1996 and 2000, SAPs were prepared for Individual Hazardous Substance Sites (IHSSs) or groups of IHSSs in close geographic proximity. In 2000, two SAPs were developed: the IA SAP (IASAP) (DOE 2000a), and the BZ SAP (BZSAP) (DOE 2002b). In 2004, the IA and BZ SAPs were combined into one SAP called the IABZSAP (DOE 2004a), which was approved by EPA and CDPHE on August 24, 2004.

[6] For historical investigations, specific information is available in OU- and IHSS-specific Work Plans and SAPs. For accelerated actions, specific information is available in the IABZSAP.

[7] This date correlates to approved Work Plans and SAPs developed pursuant to the 1991 IAG.

5.3.1 Data Quality Objectives

The EPA DQO process is used to ensure that the type, quantity, and quality of environmental data used in the decision-making process are appropriate for the intended purpose (EPA 2000). The DQO process is used to demonstrate whether data collected at RFETS are of adequate quality and quantity to define the nature and extent of surface water and sediment contamination at the site.

5.3.1.1 Step 1: State the Problem

Surface water monitoring has been conducted at RFETS throughout the site's history, from 1952 to the present. Surface water and sediment data were collected under numerous RCRA/CERCLA investigations including early OU investigations (such as, OU 5 and OU 6), accelerated action characterizations, event-related monitoring, automated monitoring, source evaluation monitoring, and predischarge sampling. Additional data were collected under various regulatory agency-approved programs (for example, surface water, sediment, and groundwater sampling conducted in accordance with the IMP [K-H 2005b, 2005c]). Since FY2004, the IMP has been updated quarterly (as needed) and annually to reflect periodic changes to the monitoring programs. The IMP, which serves as the current surface water and sediment monitoring plan for RFETS, was developed using the EPA DQO process. These investigations and characterizations resulted in the collection of surface water and sediment data for the following analyte groups:

- Radionuclides;
- Metals;
- VOCs;
- SVOCs;
- PCBs;
- Pesticides;
- Herbicides;
- Dioxins (sediment only); and
- Water Quality Parameters (including inorganics).

In response to reportable water quality values at surface water monitoring stations GS10 (South Walnut Creek), SW093 (North Walnut Creek), and/or SW027 (Woman Creek) during FY1997 through FY2005, source evaluations were conducted and additional targeted surface water, sediment, and soil samples were collected and analyzed.

To support data adequacy and completion of the RI, additional targeted surface water and sediment sampling was conducted in early 2005 (DOE 2004b) within stream channels and ponds (A-1, A-2, C-1, D-1, and D-2). Surface water and sediment samples were analyzed for radionuclides and metals. Depending on location, sediment samples were also analyzed for SVOCs, VOCs, PCBs, and dioxins.

Additional[8] pond (A-1, A-2, A-3, A-4, A-5, B-4, B-5, C-1, and C-2) sediment sampling was conducted in July 2005 (DOE 2005b). Sediment samples were analyzed for radionuclides, metals, PCBs, and SVOCs.

Based on historical investigations, characterizations, accelerated actions, and the IMP monitoring program, the specific problem to be addressed by the nature and extent of surface water and sediment evaluation is:

> *The nature and extent of site-related surface water and sediment contamination after completion of accelerated actions must be adequately defined.*

5.3.1.2 Step 2: Identify the Decision

The primary decision for surface water is:

> *Surface water contamination from site-related activities is defined as a concentration greater than background, where applicable, with greater than a 1 percent frequency of detection above the surface water standard or PQL.[9] The extent for each contaminant is defined as the downstream concentration in surface water equal to or less than the lowest surface water standard or PQL.*

The primary decision for sediment is:

> *Sediment contamination from site-related activities is defined as a concentration greater than the WRW PRG. The extent is defined for each contaminant as the downstream concentration in sediment less than the WRW PRG.*

5.3.1.3 Step 3: Identify the Inputs to the Decision

At RFETS, the IMP monitoring program collected the largest volume of groundwater, surface water, and sediment data. Targeted sampling provided a clear picture of the known or suspected sources of contamination and migration processes prior to accelerated actions. In the BZ OU, surface soil grid sampling provided additional data to support conclusions that releases to the environment did not occur outside of known or suspected historical source areas. Site data indicate that historical contamination at RFETS can be characterized as:

[8] Previous samples were collected as part of the OU 6 investigation (DOE 1992) and again in 1994 for PCBs (DOE 1996).

[9] The surface water standard is defined as the greater of the lowest surface water standard or PQL. Basic surface water standards considered include water supply, water+fish, fish ingestion, acute aquatic, chronic aquatic, aquatic life class 2, agriculture, and site-specific surface water standards for Walnut and Woman Creeks.

- Radionuclides, metals, PCBs, SVOCs (polynuclear aromatic hydrocarbons [PAHs]), and VOCs (chlorinated solvents) in surface and subsurface soil at historical Individual Hazardous Substance Sites (IHSSs), and in downgradient sediment due to runoff, but also dispersed plutonium/americium contamination in surface soil from historical wind dissemination of these contaminants from the historical 903 Pad site (IHSS 112);

- PCBs in surface and subsurface soil at former transformer sites within the IA OU, and in downgradient sediment due to runoff;

- Chlorinated solvents, uranium, nitrate, nickel, and chromium contamination of groundwater from historical sources within and near the IA OU; and

- Plutonium and americium, and to a much lesser extent chlorinated solvents, nitrate, and metals, contamination of surface water within and immediately downgradient of the IA OU.

Specific information that is needed to make the characterization decision for surface water and sediment contamination specified in Step 2 above includes:

- A listing of all surface water and sediment analytes detected during previous investigations and characterizations, including VOCs, SVOCs, pesticides, herbicides, PCBs, metals, inorganics, dioxins, water quality parameters, and radionuclides.

- Surface water and sediment data meeting specified usability criteria.

- Method detection limits (MDLs)/reporting limits (RLs) and PQLs for all data.

- Background levels for each water quality parameter, metal, and radionuclide analyte.

- RFETS site-specific and statewide surface water quality standards, listed in 5 Code of Colorado Regulations (CCR) 1002, at surface water monitoring locations. These are necessary because the nature of surface water contamination is based on a comparison to these standards. For surface water, comparison criteria include:

    1. Analytes without an associated surface water standard are eliminated from further evaluation. Analytes with a surface water standard are mapped to delineate extent. The most recent available sample result at each monitoring location is mapped.

    2. Detected surface water analyte concentrations for water quality parameters, metals, and radionuclides are compared to the background M2SD.

3. Each detected surface water analyte concentration for water quality parameters, metals, and radionuclides greater than the background M2SD, and each detected organic surface soil analyte concentration, are compared to the surface water standard.

4. Each analyte having surface water concentrations greater than the lowest surface water standard is identified as an AOI.

5. Each AOI is evaluated to determine whether the frequency of detection above the surface water standard is less than or equal to 1 percent, to demonstrate that these AOIs do not adversely impact surface water quality (Colorado Water Quality Control Division [CWQCD] guidance on data requirements and interpretation methods [CWQCD 1993, 2004, 2005]). These AOIs are eliminated.

6. Each AOI is evaluated based on historical site process knowledge. Additional information considered includes each analyte's areal distribution relative to RFETS activities, each analyte's proximity to contaminant sources, accelerated actions performed to remove a contaminant source, and each analyte's natural occurrence and distribution in the environment. AOIs are either eliminated or retained based on historical site process knowledge.

- The nature of sediment contamination based on a comparison to RFETS surface soil WRW PRGs, because there are no ARARs-based values for sediment. For sediment, comparison criteria include:

  1. Sediment analytes without an associated WRW PRG are eliminated from further evaluation. Sediment analytes with a WRW PRG are mapped to delineate extent.

  2. Detected sediment analyte concentrations for water quality parameters, metals, and radionuclides are compared to the background M2SD.

  3. Each detected sediment analyte concentration for water quality parameters, metals, and radionuclides greater than the background M2SD, and each detected organic sediment analyte concentration, are compared to the appropriate WRW PRG.[10]

  4. Each analyte having sediment concentrations greater than the WRW PRG is identified as an AOI.

  5. Each sediment AOI is evaluated based on historical information regarding process knowledge. Additional information considered includes each AOI's

[10] Analytical results compared against ESLs have been completed and mapped within the CRA, Appendix A, Volume 2, Attachment 3. Specifically, concentrations of surface water and sediment contaminants compared against ESLs have been mapped within each AEU.

areal distribution relative to RFETS activities, its proximity to contaminant sources, accelerated actions performed to remove a contaminant source, and its natural occurrence and distribution in the environment. AOIs are either eliminated or retained based on historical site process knowledge.

6. Each AOI is evaluated to determine whether the frequency of detection above the WRW PRG is less than or equal to 1 percent, to demonstrate that these AOIs do not adversely impact sediment quality. These AOIs are eliminated.

5.3.1.4 Step 4: Define the Study Boundary

The sample population of interest is the site-related contamination in surface water and sediment. Historically, a majority of the main fabrication and processing facilities were located near the center of the site, within the IA OU and, as such, contaminant releases for the site occurred primarily within the IA OU. Study boundaries are defined both spatially and temporally:

Spatial Boundary:	*The nature and extent of contamination at the site is evaluated on a sitewide basis for the four drainage basins (Rock Creek, Walnut Creek [including McKay Ditch], Woman Creek, and Lower Smart Ditch).*
Temporal Boundary:	*Surface water data collected between January 1, 2000, and July 31, 2005, and sediment data collected between June 28, 1991, and July 31, 2005, are used in this assessment.*

5.3.1.5 Step 5: Develop a Decision Rule

The decision rules that define whether surface water and sediment data are adequate are as follows:

- If sources of contamination were historically identified and adequately characterized, the data are considered adequate.
- If surface water and sediment contamination are bound by downstream concentrations, the data are considered adequate.
- If the precision, accuracy, representativeness, completeness, and comparability (PARCC) parameter assessment determines that data are of adequate quality, the data are considered adequate (see Appendix A, Volume 2, Attachment 2).

The characterization decision rules that describe how surface water contaminants are identified, and how the extent of surface water contamination is defined, are listed below.

Surface water analytes are characterized as follows:

- If no surface water standard exists, the analyte is eliminated.

- The most recent available sample result for all analytes is mapped with standards to delineate extent.

- Surface water analytes are shown to be not detected or to have no concentrations exceeding background levels. This is demonstrated as follows:
  - If all analytical results for a constituent are nondetections, the analyte is not evaluated further; otherwise, the analyte is retained and further evaluated.
  - If all analytical results for water quality parameters, metals, and radionuclides are less than the background M2SD, the analyte is not evaluated further.
  - If analyte concentrations for water quality parameters, metals, and radionuclides are greater than the background M2SD, the analyte is retained and further evaluated.

Surface water contamination (that is, associated with an AOI) is defined as surface water concentrations greater than the background M2SD, where applicable, and greater than the surface water quality standard or PQL, with a frequency of detection above that standard greater than 1 percent, and based on process knowledge that the analyte is a likely site-related contaminant. This is demonstrated as follows:

- If an analyte concentration is greater than the background M2SD, where applicable, and either the surface water standard or PQL, the analyte is designated an AOI.

- If the frequency of detection greater than the surface water standard is equal to or less than 1 percent, the AOI is eliminated from further consideration.

- Process knowledge is subsequently used to determine whether an analyte is a site-related contaminant and whether it should be retained or eliminated as an AOI. The basis for eliminating or retaining an analyte using process knowledge is documented for each analyte.

The spatial extent of surface water contamination is defined as:

- AOI concentrations as measured at surface water monitoring locations in downstream surface water bound by locations less than or equal to the background M2SD, surface water standard, or PQL, or are not detected.

The characterization decision rules that describe how sediment contaminants are identified, and how the extent of sediment contamination is defined, are listed below.

Sediment analytes are characterized as follows:

- If no WRW PRG exists, the analyte is eliminated.

- Sample results for all analytes are mapped to delineate extent.

- Sediment samples are shown to be not detected or to have no contamination levels exceeding background levels:
  - If all analytical results for a constituent are nondetections, the analyte is not evaluated further; otherwise, the analyte is retained and further evaluated.
  - If analyte concentrations for water quality parameters, metals, and radionuclides are less than the background M2SD, the analyte is not evaluated further.
  - If analyte concentrations for water quality parameters, metals, and radionuclides are greater than the background M2SD, the analyte is retained and further evaluated.

Sediment contamination (that is, associated with an AOI) is defined as a concentration that is greater than the WRW PRG, with a frequency of detection above that standard greater than 1 percent, and based on process knowledge that the analyte is a likely site-related contaminant. This is demonstrated as follows:

- If an analyte concentration is greater than the background M2SD, where applicable, and equal to or greater than the WRW PRG, the analyte is designated an AOI.
- If the frequency of detection greater than the WRW PRG is less than 1 percent, the AOI is eliminated from further consideration.
- Process knowledge is subsequently used to determine whether an analyte is a site-related contaminant and whether it should be retained or eliminated as an AOI. The basis for eliminating or retaining an analyte using process knowledge is documented for each analyte.

The spatial extent of sediment contamination is defined as:

- AOI concentrations as measured at downstream sediment monitoring locations bound by locations less than the background M2SD or WRW PRG, or are not detected.

5.3.1.6 Step 6: Specify Tolerable Limits on Decision Errors

Decision errors represent the acceptable degree of uncertainty based on the consequences of making an incorrect decision. Decision errors can be evaluated through the use of a formal statistical procedure, known as hypothesis testing. Formal statistical approaches typically express the numerical probability of the potential error in decision making. Although the possibility of decision errors cannot be eliminated, they can be minimized by increasing the number of samples collected.

The possibility of decision errors have been minimized at RFETS because, a large number of surface water and sediment samples have been collected over a period of 14 years:

- The nature and extent data were collected historically at RFETS under two regulatory agreements that have controlled characterization and cleanup actions for all media.
- All environmental data for the site were collected under regulatory agency-approved Work Plans, SAPs, Quality Assurance Project Plans (QAPjPs), and standardized contract-required analytical procedures to meet DQOs and EPA and CDPHE guidance.
- At RFETS, targeted sampling provided the greatest volume of data and thus provides a clear picture of the known or suspected sources and extent of contamination and migration processes.
- Data of sufficient quality and quantity were collected to make accelerated action decisions for all IHSSs, and confirmation sampling was conducted to indicate that remediation was successful for all IHSSs under the IA and BZ SAP (IABZSAP).
- Surface water monitoring has been conducted at RFETS throughout the site's history, from 1952 to the present.
- The IMP was required to implement environmental media monitoring programs (groundwater, surface water, sediment, and air) at the site. IMP updates included input derived from consultation with EPA, CDPHE, U.S. Fish and Wildlife Service (USFWS), cities, and stakeholders. The consultative process determined the new surface water and sediment monitoring locations, analytical suites, and the overall design of the surface water monitoring network.
- The IMP guided the majority of surface water monitoring at RFETS (K-H 2005b) and since October 1996 has had the following objectives:
  - Source location monitoring to identify potential new sources;
  - Monitoring for special temporary projects such as the AME, SWWB, and agency studies (for example, CDPHE uranium ICP/MS study);
  - Performance monitoring for the Mound Site, East Trenches, and Solar Ponds Plume Treatment Systems;
  - New source detection monitoring to evaluate statistically significant changes in water quality for water leaving the IA and entering the site retention ponds;
  - Stream segment 5 POE monitoring to evaluate a specific set of constituents against RFCA ALs, specifically for locations GS10, SW027, and SW093;
  - Predischarge monitoring to confirm that retained pond waters meet stream standards prior to discharge;

  - Stream segment 4a/4b POC monitoring to evaluate a specific set of constituents against RFCA ALs, specifically for locations GS01, GS03, GS08, GS11, and GS31;
  - Non-POC monitoring at Indiana Street to provide supplemental data to CDPHE; and
  - BZ hydrologic monitoring in support of watershed and ecological health evaluation.

- To support data adequacy and completion of the RI, additional targeted surface water and sediment sampling was conducted in early 2005 (DOE 2004b) within stream channels and ponds (A-1, A-2, C-1, D-1, and D-2).
- Additional pond sediment sampling was conducted in July 2005 for Ponds A-1, A-2, A-3, A-4, A-5, B-4, B-5, C-1, and C-2 (DOE 2005b).
- Data adequacy and data quality evaluations for the entire RI data set are provided in Appendix A, Volume 2, Attachments 2 and 3.

5.3.1.7 Step 7: Optimize the Design

This step of the DQO process has been omitted from this evaluation because existing data collected at RFETS are used in this analysis and a sampling program is not being developed.

5.3.2 Data Source

Surface water data have been collected from 404 locations (Figure 5.1) and sediment data from 369 locations (Figure 5.2) in four drainage basins (Figure 5.3) that include Rock Creek, Walnut Creek (including the McKay Ditch), Woman Creek, and Lower Smart Ditch since June 28, 1991. The number of surface water locations monitored since January 1, 2000, is 145. These records include analytical results for pesticides, herbicides, fungicides, aroclors (PCBs), dioxins, furans, SVOCs, VOCs, total and dissolved metals, total and dissolved radionuclides, and water quality parameters (including inorganics).

Surface water and sediment data used in this evaluation were extracted from the SWD using procedures discussed in Appendix A, Volume 2, Attachment 2. SWD contains approximately 6.9 million records for all media, of which approximately 690,000 records are for surface water and 121,000 records are for sediment. An analytical record in SWD represents a single result, by analyte, for a specific sampling date at a specific location. Surface water data extracted for the nature and extent evaluation consisted of analytical records for the time period between January 1, 2000, and July 31, 2005. Of the 687,982 surface water records in SWD, 77,732 records are within the data range specified. Sediment data extracted for the nature and extent evaluation consisted of analytical records for the time period between June 28, 1991, and July 31, 2005. Of the 121,015

sediment records in SWD, 80,782 records are within the data range specified. These records compose the RI-ready data used in this evaluation.

The RI-ready data were further processed through a series of data quality filters to ensure usability for determining surface water and sediment nature and extent. A detailed list of data reduction steps is included in Attachments 1 (surface water) and 2 (sediment). Of the 77,732 surface water records, 39,320 records were removed from the surface water data, resulting in 38,412 usable records. Of the 80,782 sediment records, 36,659 records were removed from the sediment data, resulting in 44,123 usable records. Examples of filter criteria used to screen the data prior to use include surface water analytes that do not have a surface water standard or maximum contaminant level (MCL) (approximately 15,182 records), sediment analytes that do not have a WRW PRG (approximately 6,300 records), locations that are no longer representative (NLR), samples analyzed by field screening methods (for example, pH, specific conductivity), samples with inappropriate analytical units (for example, milligrams per kilogram [mg/kg] instead of milligrams per liter [mg/L]), data rejected during validation, laboratory surrogates, and tentatively identified compounds (TICs).

Calculated records were also added to the RI-ready data. Examples of calculated records added to the RI-ready data include sum of the uranium isotopes and sum of Radium-226 and Radium-228 (that is, Radium-226 + Radium-228). A total of 1,779 calculated records were added to the surface water data and 388 calculated records were added to sediment data. The addition of these data resulted in 40,191 usable surface water records and 44,511 usable sediment records that were included in this nature and extent evaluation.

As stated, data that were used to evaluate the surface water and sediment nature and extent included 40,191 and 44,511 records, respectively. These records, which include U-qualified data (nondetects), were used to evaluate surface water and sediment contaminant nature and extent. Specific data used for evaluation of the surface water and sediment nature and extent are described below and presented on a compact disk read-only memory (CD ROM) in Attachments 1 (surface water) and 2 (sediment).

5.3.3 Data Adequacy and Quality

Surface water and sediment data at RFETS are considered adequate to determine the nature and extent of contamination remaining at the site because:

- Historical IHSSs (sources) were identified and the extent of contamination was defined, including known or suspected migration processes, through targeted sampling. These data are included in this evaluation.

- Historically, the distribution of surface water and sediment data, both spatially and temporally, was assessed to determine that the nature and extent of contamination is well characterized. These data are included in this evaluation.

- Agency-approved SAPs and the IMP described surface water and sediment characterization and monitoring sampling and analysis activities for all IHSSs and areas suspected of being contaminated.

In addition, data are considered adequate to bound the extent of contamination as defined in Section 5.3.1. This is demonstrated in Sections 5.7 and 5.8 and a data adequacy report of these data is provided in Appendix A, Volume 2, Attachment 3.

Data quality was assessed using a standard PARCC parameter analysis and is included in Appendix A, Volume 2, Attachment 2. Both laboratory and sample-specific quality control (QC) data were evaluated on a sitewide basis. All data have been verified and/or validated using Verification and Validation (V&V) Guidelines for each analytical method developed for RFETS. The Data Quality Assessments (DQAs) indicate the data meet the DQOs for nature and extent of contamination, and the data are adequate for use in the nature and extent of surface water and sediment contamination evaluation.

5.4 Concentration of Analytes in Surface Water and Sediment

Surface water and sediment at RFETS have been well characterized to adequately determine the horizontal and vertical extent of contamination as specified in the DQO process for the nature and extent of surface water and sediment in Section 5.3.1. Sampling and analysis focused on radionuclides, metals, PCBs, SVOCs, and VOCs in surface water or sediment, for those areas of known or suspected releases. Sampling and analysis was also performed for pesticides, herbicides, dioxins, and furans in surface water and sediment at discrete locations at RFETS to demonstrate that these classes of compounds are not contaminants at the site. Summary statistics for these data are provided in Table 5.2 (surface water) and Table 5.3 (sediment). In calculating summary statistics, a value of one-half the reported value for U-qualified results was used for organics, metals, and water quality parameters (including inorganics). This approach is consistent with EPA guidance for CERCLA sites (EPA 2002). Radionuclide U-qualified results were used at face value to calculate summary statistics per DOE guidance (DOE 1991).

5.4.1 Concentration of Analytes in Surface Water

A summary of the analyte concentrations in surface water is provided in Table 5.2. This table summarizes all surface water constituents (in the RI-ready data set) analyzed at RFETS between January 1, 2000, and July 31, 2005, regardless of whether these analytes have a surface water standard. Table 5.2 lists 272 analytes organized by analyte group (that is, dioxins and furans, herbicides, metals, PCBs, pesticides, radionuclides, SVOCs, VOCs, and water quality parameters) and filtration state (that is, total [unfiltered] or dissolved [filtered]). Of the 272 analytes listed in Table 5.2, 156 have a surface water standard; 116 do not have a surface water standard. Analytes without a surface water standard are not considered further in this evaluation. Of the 156 analytes with a surface water standard, 72 are not detected, 12 are less than background (that is, the M2SD), and 33 are less than the surface water standard. The remaining 39 analytes have exceeded the

surface water standard at some point during the sampling period (between January 1, 2000, and July 31, 2005) but may not currently exceed the surface water standard. All 272 surface water analytes are evaluated further in Section 5.5.

5.4.2 Concentration of Analytes in Sediment

A summary of the analyte concentrations in sediment is provided in Table 5.3. This table summarizes all sediment constituents (in the RI-ready data set) analyzed at RFETS between June 28, 1991, and July 31, 2005, regardless of whether these analytes have a WRW PRG. Table 5.3 lists 255 analytes organized by analyte group. Of the 255 analytes listed in Table 5.3, 194 have a WRW PRG; 61 do not have a WRW PRG. Analytes without a WRW PRG are not considered further in this evaluation. Of the 194 analytes with a WRW PRG, 75 are not detected, 1 is less than background (that is, the M2SD), and 99 are less than the WRW PRG. The remaining 19 analytes have exceeded the WRW PRG at some point during the sampling period (June 28, 1991, to July 31, 2005) but may not currently exceed the WRW PRG. All 255 sediment analytes are evaluated further in Section 5.6.

5.5 Identification of Surface Water AOIs

To identify surface water AOIs, analytical data from January 1, 2000, to July 31, 2005, were evaluated. The analytes evaluated are listed in Table 5.4. The constituents highlighted in color shown in Table 5.4 identify those constituents that have a frequency of detection less than 1 percent (green), between 1 percent and 5 percent (yellow), and greater than 5 percent (orange) above the lowest surface water standard or PQL (whichever is higher). Surface water constituents were screened and eliminated or retained as AOIs using the screening approach shown on Figure 5.4. Analytes eliminated or retained by process knowledge are listed in Table 5.5. The screening approach is described in the following sections.

5.5.1 AOI Screening Step 1 – Determination of Surface Water Standard

To evaluate the potential for impacts to surface water quality, AOI Screening Step 1 determines whether a surface water standard exists for each constituent. The surface water quality standards are the RFETS site-specific and statewide standards listed in 5 CCR 1002:

- Statewide surface water radioactive materials standards in Section 31.11(2);
- Statewide surface water interim organic pollutant standards in Section 31.11(3); and
- Site-specific surface water quality standards for segments 4a, 4b, and 5 of Big Dry Creek in Section 38.6 of the South Platte Basin Classifications and Standards.

The surface water standard is defined as the greater of the lowest surface water standard or PQL. Basic surface water standards considered include water supply, water+fish, fish

ingestion, acute aquatic, chronic aquatic, aquatic life class 2, agriculture, and site-specific surface water standards for Walnut and Woman Creeks.

Constituents that have a surface water standard and appropriate methodology (that is, total versus dissolved analysis [Table 5.4]) are carried forward to AOI Screening Step 2. These constituents are also mapped to show their areal extent (Figure 5.5 through Figure 5.22 and Attachment 1, Figures A1.1 through A1.137) Constituents that do not have a surface water standard are eliminated and not considered further.

Of the 272 surface water analytes, 116 were eliminated in Screening Step 1 and are listed below. Each of these analytes did not have a surface water standard.

Analyte Group	Surface Water Analytes Eliminated
Metals	Aluminum (total), Barium (dissolved), Beryllium (dissolved), Calcium (total and dissolved), Cobalt (total and dissolved), Lithium (total and dissolved), Magnesium (total and dissolved), Molybdenum (total and dissolved), Potassium (total and dissolved), Silicon (total), Sodium (total and dissolved), Strontium (total and dissolved), Tin (total and dissolved), Titanium (total), Vanadium (total and dissolved)
Pesticides	Diallate (cis or trans), Isodrin
Radionuclides	Americium-241 (dissolved), Plutonium-239/240 (dissolved), Uranium-233/234 (dissolved), Uranium-235 (dissolved), Uranium-238 (dissolved)
SVOCs	1,3,5-Trinitrobenzene, 1,3-Dinitrobenzene, 1,4-Naphthoquinone, 1,4-Phenylenediamine, 1-Naphthylamine, 2,3,4,6-Tetrachlorophenol, 2,6-Dichlorophenol, 2-Acetylaminofluorene, 2-Methylnaphthalene, 2-Naphthylamine, 2-Nitroaniline, 2-Nitrophenol, 3,3'-Dimethylbenzidine, 3-Methylcholanthrene, 3-Nitroaniline, 4-Aminobiphenyl, 4-Bromophenyl-phenylether, 4-Chloroaniline, 4-Chlorophenyl-phenyl ether, 4-Methylphenol, 4-Nitroaniline, 5-Nitro-o-toluidine, 7,12-Dimethylbenz(a)-anthracene, a,a-Dimethylphenethylamine, Acetophenone, Benzoic Acid, Benzyl Alcohol, bis(2-Chloroethoxy) methane, Chlorobenzilate, Dibenzofuran, Dimethoate, Dimethylaminoazobenzene, Di-n-octylphthalate, Diphenylamine, Disulfoton, Ethyl methanesulfonate, Famphur, Hexachlorophene, Hexachloropropene, Isosafrole, Kepone, Methapyrilene, Methyl methanesulfonate, Methyl parathion, Nitroquinoline-1-oxide, N-Nitrosomorpholine, N-Nitrosopiperidine, O,O,O-Triethyl phosphorothioate, o-Toluidine, Pentachloronitrobenzene, Phenacetin, Phorate, Pronamide, Safrole, Tetraethyl dithiopyrophosphate, Thionazine, Tributyl phosphate

Analyte Group	Surface Water Analytes Eliminated
VOCs	1,1,1,2-Tetrachloroethane, 1,1,2-Trichloro-1,2,2-trifluoroethane, 1,1-Dichloropropene, 1,2,3-Trichlorobenzene, 1,2,3-Trichloropropane, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, 1,3-Dichloropropane, 2,2-Dichloropropane, 2-Chloroethyl vinyl ether, 2-Chlorotoluene, 2-Hexanone, 2-Picoline, 4-Chlorotoluene, 4-Isopropyltoluene, Bromobenzene, Bromochloromethane, Dibromomethane, Dichlorodifluoromethane, Isopropylbenzene, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, tert-Butylbenzene, Trichlorofluoromethane
Water Quality Parameters	Silica, Total Petroleum Hydrocarbons

5.5.2 AOI Screening Step 2 – Nondetect and Background Comparison

In AOI Screening Step 2, surface water analytes are determined to be either not detected or detected. Analytes whose results are all nondetects are eliminated from further consideration. Detected surface water analyte results were compared against the background M2SD values presented in Appendix A, Volume 2, Attachment 5 where available. Background values are not available for organic constituents and other select inorganic and radionuclide constituents. Detections of these constituents above the detection limits are assumed to indicate their presence in the environment. Laboratory qualifier codes were used to identify whether a constituent is detected.

For those analytes where sample results are below or equal to the corresponding background M2SD, the analyte is eliminated from further consideration. Analytes that have at least one detected sample result above the background M2SD value are carried forward to AOI Screening Step 3. For analytes that are detected and do not have a background M2SD (for example, organic constituents) this screening step is skipped, and the analyte is carried forward to AOI Screening Step 3.

Of the 156 surface water analytes remaining, 84 were eliminated in Screening Step 2 and are listed below. Each of these analytes was not detected or was at or below background.

Analyte Group	Surface Water Analytes Eliminated
Metals	Antimony (dissolved), Arsenic (dissolved), Cadmium (dissolved), Chromium (dissolved), Copper (dissolved), Lead (dissolved), Mercury (dissolved), Nickel (dissolved), Thallium (total and dissolved), Zinc (dissolved)
PCBs	PCB-1016, PCB-1221, PCB-1232, PCB-1242, PCB-1248, PCB-1260
Pesticides	Hexachlorocyclopentadiene

Analyte Group	Surface Water Analytes Eliminated
SVOCs	1,2,4,5-Tetrachlorobenzene, 1,2,4-Trichlorobenzene, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, 2,4-Dichlorophenol, 2,4-Dimethylphenol, 2,4-Dinitrophenol, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, 2-Chloronaphthalene, 2-Chlorophenol, 2-Methylphenol, 3,3'-Dichlorobenzidine, 4-Nitrophenol, 4,6-Dinitro-2-methylphenol, 4-Chloro-3-methylphenol, Acenaphthylene, Aniline, Anthracene, Aramite, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, bis(2-Chloroethyl) ether, bis(2-Chloroisopropyl) ether, bis(2-ethylhexyl)phthalate, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Hexachlorobenzene, Hexachlorobutadiene, Indeno(1,2,3-cd)pyrene, Isophorone, Nitrobenzene, N-Nitrosodiethylamine, N-Nitrosodimethylamine, N-Nitrosodi-n-butylamine, N-Nitroso-di-n-propylamine, n-Nitrosodiphenylamine, N-Nitrosomethylethylamine, N-Nitrosopyrrolidine, Parathion, Pentachlorobenzene, Pentachlorophenol, Pyrene
VOCs	1,1,2-Trichloroethane, 1,2-Dibromoethane, 1,2-Dichlorobenzene, 1,2-Dichloroethane, 1,2-Dichloroethene, 1,2-Dichloropropane, 4-Methyl-2-pentanone, Bromomethane, Chlorobenzene, Chloroethane, cis-1,3-Dichloropropene, Dibromochloromethane, Hexachloroethane, m,p-Xylene, o-Xylene, Styrene, trans-1,3-Dichloropropene, Total Xylenes
Water Quality Parameters	Cyanide

5.5.3 AOI Screening Step 3 – Surface Water Standard Comparison

In AOI Screening Step 3, surface water analyte results carried forward from Screening Step 2 are compared with the corresponding surface water standard. For surface water analytes where all sample results are below or equal to the surface water standard, the analyte is eliminated from further consideration. Surface water analytes that have at least one sample result above the surface water standard are retained and proceed to AOI Screening Step 4.

Of the 72 surface water analytes remaining, 33 were eliminated in Screening Step 3 and are listed below. Each of these analytes was at or below its surface water standard for all detected sample results.

Analyte Group	Surface Water Analytes Eliminated
Metals	Boron (total), Selenium (total and dissolved), Silver (total), Uranium (dissolved)
Radionuclides	Neptunium-237 (total), Uranium Isotopes (dissolved), Uranium-235 (total)
SVOCs	Acenaphthene, Butylbenzylphthalate, Diethylphthalate, Dimethylphthalate, Di-n-butylphthalate, Fluorene, Naphthalene, Phenanthrene, Phenol
VOCs	1,1,1-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,1-Dichloroethane, 1,1-Dichloroethene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2-Butanone, Acetone, Bromodichloromethane, Bromoform, Carbon Disulfide, Chloromethane, Ethylbenzene, Toluene, trans-1,2-Dichloroethene

5.5.4 AOI Screening Step 4 – 1 Percent Frequency of Detection Screen

Per agreement between the RFCA Parties, surface water AOIs are those analytes that are present with greater than a 1 percent frequency of detection above the surface water standard for samples collected between January 1, 2000, and July 31, 2005, which accounts for temporally representative data. Elimination of the less-than-1-percent-frequency analytes is based on application of Colorado's guidance on data requirements and interpretation methods used to establish existing water quality in CWQCD) rulemaking proceedings (CWQCD, 1993, 2004, 2005). In particular, data should be ranked and the 85^{th} percentile is used as the indicative value for dissolved parameters, while the 50^{th} percentile is indicative of totals. Given the large number of samples for these analytes, more than 99 percent of the data below the identified standard are adequately representative to show that these contaminants do not adversely impact surface water quality.

For each surface water analyte that passes AOI Screening Step 3 and has a frequency of detection above the surface water standard greater than 1 percent, the analyte is carried forward to AOI Screening Step 5. The frequency of detection is based on all sitewide analytical results for each surface water analyte for the period between January 1, 2000, and July 31, 2005. For analytes whose frequency of detection above the surface water standard is less than or equal to 1 percent, the analyte is eliminated from further consideration.

Of the 39 surface water analytes remaining, 11 were eliminated in Screening Step 4 and are listed below. Each of these analytes has a frequency of detection above the surface water standard less than or equal to 1 percent at one or more locations across the site.

Analyte Group	Surface Water Analytes Eliminated
Metals	Arsenic (total), Barium (total), Cadmium (total), Copper (total), Mercury (total), Silver (dissolved)
Radionuclides	Tritium, Uranium-233/234 (total)
VOCs	Benzene
Water Quality Parameters	Fluoride, Sulfate

5.5.5 AOI Screening Step 5 – Process Knowledge Evaluation

AOI Screening Step 5 involves the determination of whether an AOI should be retained or eliminated based on process knowledge or other criteria involving professional judgment. The process knowledge evaluation involves an assessment of whether an analyte that reaches this screening step is reasonably expected to be an AOI based on historical site process knowledge (K-H 2005a). Process knowledge alone is not used to eliminate or retain an analyte as an AOI. Other analyte criteria such as its areal distribution relative to RFETS activities, its proximity to contaminant sources, accelerated actions performed to remove a contaminant source, and its natural occurrence and distribution in the environment were also considered when evaluating whether to retain or eliminate a constituent as an AOI.

Of the 28 surface water analytes remaining, 10 were eliminated in Screening Step 5 and are listed below. These analytes were eliminated by process knowledge or professional judgment as discussed in Table 5.5. The remaining 18 analytes are designated AOIs.

Analyte Group	Surface Water Analytes Eliminated
Metals	Antimony (total), Iron (total and dissolved), Manganese (total and dissolved), Uranium (total), Zinc (total)
Radionuclides	Uranium-238 (total)
Water Quality Parameters	Ammonia (as N), Chloride

5.5.6 Results of Surface Water AOI Screening

Based on the AOI screening process shown on Figure 5.4, 18 surface water AOIs were retained and include 7 VOCs (carbon tetrachloride, chloroform, cis-1,2-dichloroethene, methylene chloride, tetrachloroethene, trichloroethene, and vinyl chloride), 5 metals (dissolved aluminum and total beryllium, total chromium, total lead, and total nickel), 5 radionuclides (total americium-241, gross alpha, gross beta, plutonium-239/240, and uranium isotopes), and 1 water quality parameter (nitrate/nitrite [as N]). The constituents highlighted in color in Table 5.6 identify those constituents that have a frequency of detection between 1 percent and 5 percent (yellow) and greater than 5 percent (orange)

above the lowest surface water standard or PQL (whichever is higher). Table 5.7 lists the surface water AOIs by drainage basin.

The frequency of detection for the surface water AOIs ranges between 1 to less than 5 percent (9 constituents), and greater than 5 percent (9 constituents). The AOIs identified and retained in surface water are listed in Table 5.6 along with summary statistics for each constituent. Figure 5.5 through Figure 5.22 show the nature and extent of surface water AOIs. These maps represent the most recent result at each surface water location for the period between January 1, 2000, and July 31, 2005. Surface water analytes eliminated as AOIs based on process knowledge or professional judgment are listed in Table 5.5. The extent of other surface water constituents included in the nature and extent evaluation that were not retained as AOIs are included on a CD ROM as Figures A1.1 through A1.138 in Attachment 1.

5.5.6.1 PCBs, Dioxins, and Furans

No PCB, dioxin, or furan AOIs were identified in surface water. Table 5.4 summarizes the PCBs, dioxins, and furans analyzed for and reported in the data evaluated, but not retained as surface water AOIs. The nature and extent of PCBs, dioxins, and furans that were not identified as AOIs are shown on the extent maps in Attachment 1 (Figures A1.1 through A1.7).

5.5.6.2 Pesticides, Herbicides, and Fungicides

No pesticide, herbicide, or fungicide AOIs were identified in surface water. Table 5.4 summarizes the pesticides, herbicides, and fungicides analyzed for and reported in the data evaluated, but not retained as surface water AOIs. The nature and extent of pesticides, herbicides, and fungicides that were not identified as AOIs are shown on the extent maps in Attachment 1 (Figures A1.8 through A1.9).

5.5.6.3 SVOCs

No SVOC AOIs were identified in surface water. Table 5.4 summarizes the SVOCs analyzed for and reported in the data evaluated, but not retained as surface water AOIs. The nature and extent of SVOCs that were not identified as AOIs are shown on the extent maps in Attachment 1 (Figures A1.10 through A1.64).

5.5.6.4 VOCs

Seven VOC AOIs (carbon tetrachloride, chloroform, cis-1,2-dichloroethene, methylene chloride, tetrachloroethene, trichloroethene, and vinyl chloride) were identified in surface water. Table 5.4 summarizes the VOCs analyzed for and reported in the data evaluated, but not retained as surface water AOIs. The nature and extent of VOCs that were not identified as AOIs are shown on the extent maps in Attachment 1 (Figures A1.65 through A1.98). Table 5.6 lists the seven VOCs retained as surface water AOIs. Section 5.7.3.1 and Figure 5.5 through Figure 5.11 present further discussion of the nature and extent of VOC AOIs in surface water.

5.5.6.5 Metals

Five metal AOIs (dissolved aluminum and total beryllium, total chromium, total lead, and total nickel) were identified in surface water. Table 5.4 summarizes the metals analyzed for and reported in the data evaluated, but not retained as surface water AOIs. The nature and extent of metals that were not identified as AOIs are shown on the extent maps in Attachment 1 (Figures A1.99 through A1.127). Table 5.6 lists the five metals retained as metal AOIs. Section 5.7.3.2 and Figure 5.12 through Figure 5.16 present further discussion of the nature and extent of metal AOIs in surface water.

5.5.6.6 Radionuclides

Five radionuclide AOIs (total americium-241, gross alpha, gross beta, plutonium-239/240, and uranium isotopes) were identified in surface water. Table 5.4 summarizes the radionuclides analyzed for and reported in the data evaluated, but not retained as surface water AOIs. The nature and extent of radionuclides that were not identified as AOIs are shown on the extent maps in Attachment 1 (Figures A1.128 through A1.133). Table 5.6 lists the five radionuclides retained as AOIs. Section 5.7.3.3 and Figure 5.17 through Figure 5.21 present further discussion of the nature and extent of radionuclide AOIs in surface water.

5.5.6.7 Water Quality Parameters

One water quality parameter AOI (nitrate/nitrite [as N]) was identified in surface water. Table 5.4 summarizes the water quality parameters analyzed for and reported in the data evaluated, but not retained as surface water AOIs. The nature and extent of water quality parameters that were not identified as AOIs are shown on the extent maps in Attachment 1 (Figures A1.134 through A1.138). Table 5.6 lists the one water quality parameter retained as an AOI. Section 5.7.3.4 and Figure 5.22 present further discussion of the nature and extent of water quality parameter AOIs in surface water.

5.6 Identification of Sediment AOIs

To identify sediment AOIs, analytical data from June 28, 1991, to July 31, 2005, were evaluated. The analytes evaluated are listed in Table 5.8. The constituents highlighted in color in Table 5.8 identify those constituents that have a frequency of detection less than 1 percent (green), between 1 percent and 5 percent (yellow), and greater than 5 percent (orange) above the WRW PRG. Sediment constituents were screened and eliminated or retained as AOIs using the screening approach shown on Figure 5.23. Analytes eliminated or retained by process knowledge are listed in Table 5.9. The screening approach is described in the following sections.

5.6.1 AOI Screening Step 1 – Preliminary Remediation Goal Identification

To evaluate the potential for impacts to sediments, AOI Screening Step 1 determines whether a WRW PRG exists for the sediment constituent. Constituents without a PRG are eliminated from further evaluation. Constituents that have a PRG are carried forward

to Screening Step 2. These constituents are also mapped to show their areal extent (Figure 5.24 through Figure 5.28 and Attachment 2, Figures A2.1 through A2.194).

Of the 255 sediment analytes, 61 were eliminated in Screening Step 1 and are listed below. Each of these analytes did not have a WRW PRG.

Analyte Group	Sediment Analytes Eliminated
Dioxins and Furans	1234678-HpCDF, 1234789-HpCDF, 123478-HxCDF, 123678-HxCDF, 123789-HxCDF, 12378-PeCDF, 234678-HxCDF, 23478-PeCDF, 2378-TCDD, Heptachlorodibenzo-p-dioxin, OCDD, OCDF, Pentachlorodibenzo-p-dioxin
Herbicides	Ametryne, Dichloroprop (2-[2,4-dichlorophenoxy]-propanoic acid)
Metals	Calcium, Cesium, Magnesium, Potassium, Silicon, Sodium
Radionuclides	Gross Alpha, Gross Beta
SVOCs	2-Nitrophenol, 3-Nitroaniline, 4-Bromophenyl-phenylether, 4-Chloro-3-methylphenol, 4-Chlorophenyl-phenyl ether, Acenaphthylene, Benzo(g,h,i)perylene, bis(2-Chloroethoxy) Methane, Phenanthrene
VOCs	1,1-Dichloropropene, 1,2,3-Trichlorobenzene, 1,3-Dichloropropane, 2,2-Dichloropropane, 2-Hexanone, 4-Chlorotoluene, 4-Isopropyltoluene, Acetonitrile, Bromobenzene, Bromochloromethane, Dibromomethane, Gasoline, n-Butanol, n-Butylbenzene, n-Propylbenzene, Pyridine, sec-Butylbenzene, tert-Butylbenzene
Pesticides	Atraton, Prometon, Prometryn, Propazine, Simetryn, Terbutryn, Terbutylazine
Water Quality Parameters	Chloride, Silica, Sulfate, Sulfide

5.6.2 AOI Screening Step 2 – Nondetect and Background Comparison

In Screening Step 2, sediment analytes were determined to be either not detected or detected. Analytes whose results are all nondetects are eliminated from further consideration. Detected sediment analytes were compared against the background M2SD values presented in Appendix A, Volume 2, Attachment 5, where available. Background values are not available for organic constituents and other select inorganic and radionuclide constituents. Detection of these constituents above the detection limits indicates their presence in the environment. Laboratory qualifier codes were used to identify whether a constituent is detected.

For those analytes where sample results are below or equal to the corresponding background M2SD, the analyte is eliminated from further consideration. Analytes that

have at least one detected sample result above the background M2SD are carried forward to AOI Screening Step 3. Analytes that are detected and do not have a background M2SD are also carried forward to AOI Screening Step 3.

Of the 194 sediment analytes remaining, 76 were eliminated in Screening Step 2 and are listed below. Each of these analytes was either not detected or at or below the background M2SD.

Analyte Group	Sediment Analytes Eliminated
Herbicides	2,4,5-T, 2,4,5-TP (Silvex), 2,4-D, 2,4-DB, Dalapon, Dicamba, Dinoseb, MCPA, MCPP
Metals	Molybdenum
PCBs	PCB-1016, PCB-1221, PCB-1232, PCB-1242, PCB-1248
Pesticides	4,4'-DDD, alpha-BHC, beta-Chlordane, Chlordane, Endosulfan II, Endosulfan Sulfate, Endrin, Endrin Aldehyde, Endrin Ketone, Hexachlorocyclopentadiene, Simazine, Toxaphene
SVOCs	2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, 2,4-Dichlorophenol, 2,4-Dimethylphenol, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, 2-Chloronaphthalene, 2-Chlorophenol, 2-Nitroaniline, 3,3'-Dichlorobenzidine, 4-Chloroaniline, 4-Nitroaniline, bis(2-Chloroethyl) Ether, bis(2-Chloroisopropyl) Ether, Hexachlorobenzene, Isophorone, Nitrobenzene, N-Nitroso-di-n-propylamine, n-Nitrosodiphenylamine
VOCs	1,1,1,2-Tetrachloroethane, 1,1,2-Trichloro-1,2,2-trifluoroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethane, 1,2,3-Trichloropropane, 1,2-Dibromoethane, 1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,3,5-Trimethylbenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,4-Dioxane, 2-Chlorotoluene, 2-Methyl-1-propanol, Bromodichloromethane, Bromoform, Carbon Disulfide, Chlorobenzene, Chloroethane, Chloromethane, cis-1,3-Dichloropropene, Dibromochloromethane, Dichlorodifluoromethane, Ether, Ethyl Acetate, Hexachloroethane, Isopropylbenzene, Styrene, trans-1,3-Dichloropropene, Vinyl Acetate

5.6.3 AOI Screening Step 3 – Preliminary Remediation Goal Comparison

AOI Screening Step 3 involves comparison of the sediment results with the WRW PRG. The WRW PRG values used to compare with the sediment results were developed in the CRA for a WRW based on a target excess carcinogenic risk of 1×10^{-6} or an HQ of 0.1. If a constituent's maximum result is less than or equal to the PRG, it is eliminated as an

AOI. For constituents where the maximum result is greater than the PRG, it is retained as an AOI and carried forward to AOI Screening Step 4.

Of the 118 sediment analytes remaining, 99 were eliminated in Screening Step 3 and are listed below. Each of these analytes was at or below its WRW PRG.

Analyte Group	Sediment Analytes Eliminated
Dioxins and Furans	123478-HxCDD, 123678-HxCDD, 123789-HxCDD, 2378-TCDD
Metals	Barium, Beryllium, Boron, Cadmium, Chromium (VI), Cobalt, Copper, Lead, Lithium, Mercury, Nickel, Selenium, Strontium, Tin, Titanium, Uranium, Vanadium, Zinc
Pesticides	4,4'-DDE, 4,4'-DDT, Aldrin, alpha-Chlordane, Atrazine, beta-BHC, delta-BHC, Dieldrin, Endosulfan I, gamma-BHC (Lindane), gamma-Chlordane, Heptachlor, Heptachlor Epoxide, Methoxychlor
Radionuclides	Strontium-89/90, Uranium Isotopes, Uranium-233/234, Uranium-235
SVOCs	1,2,4-Trichlorobenzene, 2,4-Dinitrophenol, 2-Methylnaphthalene, 2-Methylphenol, 4,6-Dinitro-2-methylphenol, 4-Methylphenol, 4-Nitrophenol, Acenaphthene, Anthracene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzoic Acid, Benzyl Alcohol, bis(2-ethylhexyl)phthalate, Butylbenzylphthalate, Carbazole, Chrysene, Dibenzofuran, Diethylphthalate, Dimethylphthalate, Di-n-butylphthalate, Di-n-octylphthalate, Fluoranthene, Fluorene, Hexachlorobutadiene, Indeno(1,2,3-cd)pyrene, Naphthalene, Pentachlorophenol, Phenol, Pyrene
VOCs	1,1,1-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,1-Dichloroethene, 1,2,4-Trimethylbenzene, 1,2-Dichloroethane, 1,2-Dichloroethene, 2-Butanone, 4-Methyl-2-pentanone, Acetone, Benzene, Bromomethane, Carbon Tetrachloride, Chloroform, cis-1,2-Dichloroethene, Ethylbenzene, Methylene Chloride, Tetrachloroethene, Toluene, Total Xylenes, trans-1,2-Dichloroethene, Trichloroethene, Trichlorofluoromethane, Vinyl Chloride
Water Quality Parameters	Cyanide, Fluoride, Nitrate/Nitrite (as N), Nitrate (as N), Nitrite (as N)

5.6.4 AOI Screening Step 4 – 1 Percent Frequency of Detection

Per agreement between the RFCA Parties, sediment AOIs are those analytes that are present with greater than a 1 percent frequency of detection above the sediment WRW PRG. For each sediment analyte that passes AOI Screening Step 3 and has a frequency of

detection above the WRW PRG greater than 1 percent, the analyte is carried forward to AOI Screening Step 5. The frequency of detection is based on all sitewide analytical results for each sediment analyte for the period between June 28, 1991, and July 31, 2005. For analytes whose frequency of detection above the WRW PRG is less than or equal to 1 percent, the analyte is eliminated from further consideration.

Of the 19 sediment analytes remaining, 7 were eliminated in Screening Step 4 and are listed below. The frequency of detection above the WRW PRG for each of the eliminated analytes is less than or equal to 1 percent.

Analyte Group	Sediment Analytes Eliminated
Metals	Antimony, Silver, Thallium
PCBs	PCB-1254, PCB-1260
Radionuclides	Uranium-238
SVOCs	Dibenz(a,h)anthracene

5.6.5 AOI Screening Step 5 – Process Knowledge Evaluation

AOI Screening Step 5 involves the determination of whether an AOI should be retained or eliminated based on process knowledge or other criteria involving professional judgment. The process knowledge evaluation involves an assessment of whether an analyte that reaches this screening step is reasonably expected to be an AOI based on historical site process knowledge (K-H 2005a). Process knowledge alone is not used to eliminate or retain an analyte as an AOI. Other analyte criteria such as its areal distribution relative to RFETS activities, its proximity to contaminant sources, accelerated actions performed to remove a contaminant source, and its natural occurrence and distribution in the environment were also considered when evaluating whether to retain or eliminate a constituent as an AOI.

Of the 12 sediment analytes remaining, 7 were eliminated in Screening Step 5 and are listed below. These analytes were eliminated by process knowledge or professional judgment as discussed in Table 5.9. The remaining five analytes are designated sediment AOIs.

Analyte Group	Sediment Analytes Eliminated
Metals	Aluminum, Iron, Manganese
Radionuclides	Cesium-134, Cesium-137, Radium-226, Radium-228

5.6.6 Results of Sediment AOI Screening

Based on the AOI screening process shown on Figure 5.23, five sediment AOIs were identified and retained, including one SVOC (benzo[a]pyrene), two metals (arsenic and chromium), and two radionuclides (americium-241 and plutonium-239/240). The constituents highlighted in color in Table 5.10 identify those constituents that have a frequency of detection between 1 percent and 5 percent (yellow) and greater than 5 percent (orange) above the WRW PRG. Table 5.11 lists the sediment AOIs by drainage basin.

The frequency of detection for the sediment AOIs above the WRW PRG ranges between 1 and less than 5 percent (three constituents) and greater than 5 percent (two constituents). The sediment constituents identified and retained as AOIs are listed in Table 5.10 along with summary statistics for each constituent. Figure 5.24 through Figure 5.28 show the nature and extent of sediment AOIs. These maps represent the most recent result at each sediment location for the period between June 28, 1991 and July 31, 2005. Sediment analytes eliminated as AOIs based on process knowledge or professional judgment are listed in Table 5.9. The extent of other sediment constituents included in the nature and extent evaluation that were not retained as AOIs are included on a CD ROM as Figures A2.1 through A2.189 in Attachment 2.

5.6.6.1 PCBs, Dioxins, and Furans

No PCBs, dioxins, or furans were identified as sediment AOIs. Table 5.8 summarizes PCBs and dioxins analyzed for and reported in the data evaluated. The nature and extent of PCBs, dioxins, and furans that were not identified as sediment AOIs are listed in Table 5.8 and shown on the extent maps in Attachment 2 (Figures A2.1 through A2.11).

5.6.6.2 Pesticides and Herbicides

No pesticides, herbicides, or fungicides were identified as sediment AOIs. Table 5.8 summarizes pesticides, herbicides, and fungicides analyzed for and reported in the data evaluated. The nature and extent of pesticides, herbicides, and fungicides that were not identified as sediment AOIs are listed in Table 5.8 and shown on the extent maps in Attachment 2 (Figures A2.12 through A2.47).

5.6.6.3 SVOCs

Benzo(a)pyrene is the only SVOC retained as a sediment AOI (Table 5.10). Figure 5.24 shows the extent of benzo(a)pyrene in sediments. Table 5.8 summarizes other SVOCs analyzed for and reported in the data evaluated. SVOCs that were not identified as sediment AOIs are listed in Table 5.8 and shown on the extent maps in Attachment 2 (A2.48 through A2.97). Section 5.8.3.1 and Figure 5.24 present further discussion of SVOC sediment AOIs.

5.6.6.4 VOCs

No VOCs were identified as sediment AOIs. Table 5.8 summarizes VOCs analyzed and reported in the data evaluated. VOCs that were not identified as sediment AOIs are listed in Table 5.8 and shown on the extent maps in Attachment 2 (Figures A2.98 through A2.156).

5.6.6.5 Metals

Two metals (arsenic and chromium) were identified as sediment AOIs (Table 5.10). Table 5.8 summarizes other metals analyzed for and reported in the data evaluated, but not retained as sediment AOIs. Metals that were not identified as sediment AOIs are shown on the extent maps in Attachment 2 (Figures A2.151 through A2.175). Section 5.8.3.2 and Figure 5.25 and Figure 5.26 present further discussion of the nature and extent of metal sediment AOIs.

5.6.6.6 Radionuclides

Two radionuclides (americium-241 and plutonium-239/240) were identified as sediment AOIs (Table 5.10). Table 5.8 summarizes the other radionuclides analyzed for and reported in the data evaluated, but not retained as sediment AOIs. The nature and extent of radionuclides that were not identified as sediment AOIs are shown on the extent maps in Attachment 2 (Figures A2.176 through A2.184). Section 5.8.3.3 and Figure 5.27 and Figure 5.28 present further discussion of the nature and extent of radionuclide sediment AOIs.

5.6.6.7 Water Quality Parameters

No water quality parameters were identified as sediment AOIs. Table 5.8 summarizes sediment water quality parameters analyzed for and reported in the data evaluated. The nature and extent of sediment water quality parameters that were not identified as AOIs are listed in Table 5.8 and shown on the extent maps in Attachment 2 (Figures A2.185 through A2.189).

5.7 Nature and Extent of Surface Water Contamination

This section summarizes the nature and extent of surface water AOIs at RFETS. For each of the 18 AOIs in surface water, maps were created to show the relative concentration and extent of contamination at the site (Figure 5.5 through Figure 5.22).

5.7.1 Surface Water AOI Extent Maps

For each surface water AOI extent map, the results are displayed as four categories to identify the predominant areas of contaminant extent:

- Locations where the AOI is not detected (gray);

- Locations where the AOI is detected but is less than or equal to the surface water background M2SD for metals, radionuclides, or water quality parameters or surface water standard for organic components (blue);

- Locations where the AOI is greater than the background M2SD but less than or equal to the surface water standard if applicable (that is, lowest surface water standard or PQL, whichever is higher) (yellow); and

- Locations where the AOI is greater than the surface water standard (that is, lowest surface water standard or PQL, whichever is higher) (red).

5.7.2 Temporal Data

AOI sampling location symbol shapes are designed to show the 5-year time interval that the sample was collected. The time intervals identified on the surface water AOI extent figures are defined as:

- Sample collected since January 1, 2000 (circle).

5.7.3 Extent of AOIs in Surface Water

Each of the surface water AOIs are mapped on Figure 5.5 through Figure 5.22 and are discussed by analyte group below. Figure 5.1 and Figure 5.3 show the location of surface water monitoring locations, drainage basins, and site features discussed in the text.

5.7.3.1 VOCs

Carbon tetrachloride, chloroform, cis-1,2-dichloroethene, methylene chloride, tetrachloroethene, trichloroethene, and vinyl chloride were the only VOCs identified as surface water AOIs (Table 5.6). Figure 5.5 through Figure 5.11 show the areal distribution of the surface water VOC AOIs.

Figure 5.5 shows the extent of carbon tetrachloride in surface water. The majority (89 percent) of the sample results are less than the surface water standard. The frequency of detection of carbon tetrachloride in surface water above the surface water standard is approximately 11 percent. Carbon tetrachloride occurrences above the surface water standard are primarily found at the former Buildings 771 and 774 footing drain outfalls and at SW061 on South Walnut Creek.

Figure 5.6 shows the extent of chloroform in surface water. The majority (97 percent) of the sample results are less than the surface water standard. The frequency of detection of chloroform in surface water above the surface water standard is approximately 3 percent. Chloroform occurrences above the surface water standard are primarily found at the former Buildings 771 and 774 footing drain outfalls and at SW33503 on the unnamed drainage between former Buildings 371 and 771.

Figure 5.7 shows the extent of cis-1,2-dichloroethene in surface water. The majority (99 percent) of the cis-1,2-dichloroethene results are less than the surface water standard. The frequency of detection of cis-1,2-dichloroethene in surface water above the surface water standard is approximately 1 percent. cis-1,2-Dichloroethene occurrences above the surface water standard are found at the former SW056 outfall south of the former 991 parking lot.

Figure 5.8 shows the extent of methylene chloride in surface water. The majority (96 percent) of the sample results are less than the surface water standard. The frequency of detection of methylene chloride in surface water above the surface water standard is approximately 4 percent. Methylene chloride occurrences above the surface water standard are primarily at the former SW056 outfall south of the former 991 parking lot, and at SW061 and SW132 on South Walnut Creek.

Figure 5.9 shows the extent of tetrachloroethene in surface water. The majority (94 percent) of the sample results are less than the surface water standard. The frequency of detection of tetrachloroethene in surface water above the surface water standard is approximately 6 percent. Tetrachloroethene occurrences above the surface water standard are primarily found at the former Building 771 footing drain outfall and at the former SW056 outfall south of the former 991 parking lot.

Figure 5.10 shows the extent of trichloroethene in surface water. The majority (95 percent) of the sample results are less than the surface water standard. The frequency of detection of trichloroethene in surface water above the surface water standard is approximately 5 percent. Trichloroethene occurrences above the surface water standard are primarily found at the former SW056 outfall south of the former 991 parking lot, along South Walnut Creek at Ponds B-2 and B-4, and at a seep between Woman Creek and the South Interceptor Ditch (SID) at SW10300 southeast of the historical 903 Pad.

Figure 5.11 shows the extent of vinyl chloride in surface water. The majority (99 percent) of the sample results are less than the surface water standard. The frequency of detection of vinyl chloride in surface water above the surface water standard is approximately 1 percent. Vinyl chloride occurrences above the surface water standard are primarily found at the former SW056 outfall south of the former 991 parking lot and at Pond B-2 on South Walnut Creek.

5.7.3.2 Metals

Dissolved aluminum and total beryllium, total chromium, total lead, and total nickel were the only metals identified as surface water AOIs (Table 5.6). Figure 5.12 through Figure 5.16 show the areal distribution of the metal AOIs.

Figure 5.12 shows the extent of dissolved aluminum in surface water. The majority (97 percent) of the sample results are less than the background M2SD. Note that the background M2SD for dissolved aluminum is above the surface water standard. The frequency of detection of dissolved aluminum in surface water above both the background M2SD and the surface water standard is approximately 3 percent. Dissolved

aluminum occurrences above the surface water standard are primarily found at the former Building 779 footing drain outfall (SW085).

Figure 5.13 shows the extent of total beryllium in surface water. The majority (96 percent) of the sample results are less than the background M2SD. The frequency of detection of total beryllium in surface water above the surface water standard is approximately 1 percent. Total beryllium occurrences above the surface water standard are primarily found at GS06 on the Owl Branch segment of Woman Creek, GS38 on the Central Avenue Ditch just east of former 8th Street, GS50 on a drainage ditch northeast of former Building 990, and GS60 on a ditch northeast of former Buildings 371/374 along the former Protected Area (PA) patrol road.

Figure 5.14 shows the extent of total chromium in surface water. The majority (97 percent) of the sample results are less than the background M2SD. Note that the background M2SD for total chromium is above the surface water standard. The frequency of detection of total chromium in surface water above both the background M2SD and the surface water standard is approximately 3 percent. Total chromium occurrences above the surface water standard are primarily found at GS06 on the Owl Branch segment to Woman Creek, GS38 on the Central Avenue Ditch just east of former 8th Street, GS49 on the west-northwest side of former Building 776, GS50 on a drainage ditch northeast of former Building 990, GS60 on a ditch northeast of former Buildings 371/374 along the former PA patrol road, and SW018 on the North Walnut Creek tributary just south of the former Building 771 trailers.

Figure 5.15 shows the extent of total lead in surface water. The majority (82 percent) of the sample results are less than the background M2SD. The frequency of detection of total lead in surface water above the surface water standard is approximately 5 percent. Total lead occurrences above the surface water standard are primarily found at GS01 at Woman Creek and Indiana Street, GS38 on the Central Avenue Ditch just east of former 8th Street, GS49 on the west-northwest side of former Building 776, GS50 on a drainage ditch northeast of former Building 990, and GS60 on a ditch northeast of former Buildings 371/374 along the former PA patrol road.

Figure 5.16 shows the extent of total nickel in surface water. The majority (94 percent) of the sample results are less than the background M2SD. The frequency of detection of total nickel in surface water above the surface water standard is approximately 1 percent. Total nickel occurrences above the surface water standard are primarily found at GS38 on the Central Avenue Ditch just east of former 8th Street and GS60 on a ditch northeast of former Buildings 371/374 along the former PA patrol road.

5.7.3.3 Radionuclides

Total americium-241, gross alpha, gross beta, plutonium-239/240, and uranium isotopes were the only radionuclides identified as surface water AOIs (Table 5.6). Figure 5.17 through Figure 5.21 show the areal distribution of the radionuclide AOIs.

Figure 5.17 shows the extent of total americium-241 in surface water. Most (60 percent) of the sample results are less than the background M2SD. The frequency of detection of total americium-241 in surface water above the surface water standard is approximately 17 percent. Total americium-241 occurrences above the surface water standard are primarily found within the former IA and along Walnut and Woman Creeks downstream of the former IA.

Figure 5.18 shows the extent of total gross alpha in surface water. The majority (91 percent) of the sample results are less than the background M2SD. Note that the background M2SD for total gross alpha is above the surface water standard. The frequency of detection of total gross alpha in surface water above both the background M2SD and the surface water standard is approximately 9 percent. Total gross alpha occurrences above the surface water standard are primarily found at SW20105 along the unnamed drainage between former Buildings 371 and 771 and at CG49-031 in the former Bowman's Pond area.

Figure 5.19 shows the extent of total gross beta in surface water. The majority (91 percent) of the sample results are less than the background M2SD. Note that the background M2SD for total gross beta is above the surface water standard. The frequency of detection of total gross beta in surface water above both the background M2SD and the surface water standard is approximately 9 percent. Total gross beta occurrences above the surface water standard are primarily found at SW20105 along the unnamed drainage between former Buildings 371 and 771.

Figure 5.20 shows the extent of total plutonium-239/240 in surface water. Most (54 percent) of the sample results are less than the background M2SD. The frequency of detection of total plutonium-239/240 in surface water above the surface water standard is approximately 21 percent. Total plutonium-239/240 occurrences above the surface water standard are primarily found within the former IA and along Walnut and Woman Creeks downstream of the former IA.

Figure 5.21 shows the extent of total uranium isotopes in surface water. The majority (94 percent) of the sample results are less than the background M2SD. The frequency of detection of total uranium isotopes in surface water above the surface water standard is less than 4 percent. The only total uranium isotopes occurrence above the surface water standard is found along North Walnut Creek at Ponds A-1 and A-2, SW036 on the SID south of former Building 664, and SW120 along a drainage ditch north of the former Solar Evaporation Ponds (SEP) along the south side of the former PA patrol road.

5.7.3.4 Water Quality Parameters

Nitrate/nitrite (as N) was the only water quality parameter identified as a surface water AOI (Table 5.6). Figure 5.22 shows the extent of nitrate/nitrite (as N) in surface water. Most (58 percent) of the sample results are less than the background M2SD. The frequency of detection of nitrate/nitrite (as N) in surface water above the surface water standard is approximately 16 percent. Nitrate/nitrite (as N) occurrences above the surface

water standard are primarily found at the outfall from the former Building 774 footing drain, GS13 on North Walnut Creek, and Pond A-2 and A-3 outfalls on North Walnut Creek.

5.7.4 Summary of Surface Water AOIs

Eighteen surface water AOIs were identified and retained for further evaluation (Table 5.6 and Figure 5.5 through Figure 5.22). These AOIs include seven VOCs (carbon tetrachloride, chloroform, cis-1,2-dichloroethene, methylene chloride, tetrachloroethene, trichloroethene, and vinyl chloride), five metals (dissolved aluminum and total beryllium, total chromium, total lead, and total nickel), five radionuclides (total americium-241, gross alpha, gross beta, plutonium-239/240, and uranium isotopes), and one water quality parameter (nitrate/nitrite [as N]. All of these AOIs have greater than 1 percent frequency of detection above their respective surface water standards at one or more locations across the site. Table 5.7 lists the surface water AOIs by drainage basin. These AOIs are further evaluated in Section 8.0.

5.8 Nature and Extent of Sediment Contamination

This section summarizes the nature and extent of sediment AOIs at RFETS. For each of the five sediment AOIs (Table 5.10), maps were made to show the extent of contaminants in sediment at the site. Sediment data are shown as sediment AOI extent maps (Figure 5.24 through Figure 5.28).

5.8.1 Sediment AOI Extent Maps

For each sediment AOI extent map, results are displayed as five categories to identify the predominant areas of contaminant extent:

- Locations where the AOI is not detected (gray);
- Locations where the AOI is detected but is less than or equal to the sediment background M2SD for metals and radionuclides or WRW PRG for organic compounds (blue);
- Locations where the AOI is greater than the background M2SD for metals and radionuclides, but is less than or equal to the WRW PRG (that is, a target 1×10^{-6} excess carcinogenic risk or an HQ of 0.1) (green);
- Locations where the AOI is greater than the WRW PRG but is less than or equal to 10 times the WRW PRG (that is, a 1×10^{-5} excess carcinogenic risk or an HQ of 1) (yellow); and
- Locations where the AOI is greater than 10 times the WRW PRG (red).

5.8.2 Temporal Data

AOI sampling location symbol shapes are designed to show the 5-year time interval that the sample was collected. The time intervals identified on the AOI extent figures are defined as:

- Samples collected between June 28, 1991, and December 31, 1994 (triangle);
- Samples collected between January 1, 1995, and December 31, 1999 (square); and
- Samples collected since January 1, 2000 (circle).

5.8.3 Extent of AOIs in Sediment

Each of the sediment AOIs are mapped on Figure 5.24 through Figure 5.28 and are discussed by analyte group below. Figure 5.2 and Figure 5.3 show the sediment sampling locations, surface water drainage basins, and site features discussed in the text.

5.8.3.1 SVOCs

Benzo(a)pyrene is the only SVOC identified as a sediment AOI (Table 5.10). Figure 5.24 shows the extent of benzo(a)pyrene in sediments. Benzo(a)pyrene concentrations in sediment are above the WRW PRG (approximately 10 percent), but less than 10 times the PRG. Benzo(a)pyrene occurrences above the WRW PRG are primarily found along South Walnut Creek at Pond B-4, the former Bowman's Pond area, the Central Avenue Ditch adjacent to former Tanks 221 and 224, the historical 750 Pad, the historical 904 Pad, the Central Avenue Ditch upstream of the former North Perimeter Road, the former North Perimeter Road west of former Building 371, and a tributary to the SID that drains the former Building 881 area.

5.8.3.2 Metals

Arsenic and chromium were the only metals identified as sediment AOIs (Table 5.10). Figure 5.25 and Figure 5.26 show the areal distribution of the sediment metal AOIs.

Figure 5.25 shows the extent of arsenic in sediments. The majority (75 percent) of the arsenic results are less than the background M2SD. Note that the arsenic background M2SD is greater than the WRW PRG. The frequency of arsenic concentrations in sediment above both the background M2SD and WRW PRG is approximately 25 percent. Only 0.3 percent of the arsenic sediment samples have a frequency of detection above 10 times the WRW PRG. Arsenic occurrences above the PRG are primarily found along North and South Walnut Creeks, the SID, former 400 Area, Central Avenue Ditch, Pond C-2, No Name Gulch downstream of the East Landfill Pond, Rock Creek, and at Ponds D-1 and D-2. Single occurrences are found on Owl Branch, a tributary to Woman Creek south of Owl Branch, and the Antelope Creek headwaters. The concentration in the sediment sample from the headwaters of Antelope Creek is greater than 10 times the WRW PRG.

Figure 5.26 shows the extent of chromium in sediments. The majority (90 percent) of the chromium results are less than the background M2SD. The frequency of detection of chromium in sediment above the WRW PRG is approximately 4 percent. None of the chromium samples exceed 10 times the WRW PRG. Chromium occurrences above the WRW PRG are primarily found along North Walnut Creek upstream of Pond A-1 and in Ponds A-2 and A-3, Pond B-4, Pond C-1, along the West Diversion Ditch, former 400 Area, along the tributary ditch to the SID southwest of former Building 664, and along the historical 750 Pad.

5.8.3.3 Radionuclides

Americium-241 and plutonium-239/240 were the only radionuclides identified as sediment AOIs (Table 5.10). Figure 5.27 through Figure 5.28 show the areal distribution of the radionuclide AOIs.

Figure 5.27 shows the extent of total americium-241 in sediments. Approximately one-half (52 percent) of the americium-241 results are less than the background M2SD. The frequency of detection of americium-241 in sediment above the WRW PRG is approximately 1 percent. None of the americium-241 samples exceed 10 times the WRW PRG. The only occurrences of americium-241 above the WRW PRG are found in Pond B-4.

Figure 5.28 shows the extent of plutonium-239/240 in sediments. Most (64 percent) of the plutonium-239/240 results are less than the background M2SD. The frequency of detection of plutonium-239/240 in sediment above the WRW PRG is approximately 3 percent. Only 0.2 percent of the plutonium-239/240 results is above 10 times the WRW PRG. Plutonium-239/240 occurrences in sediment above the PRG are primarily found along North Walnut Creek at Ponds A-1 and A-2, South Walnut Creek at Pond B-4, and single occurrences along the SID south of the historical 903 Pad, a ditch southeast of the historical 903 Pad in the Lip Area, and the Central Avenue Ditch at the former corner of 8th and Central Avenues.

5.8.4 Summary of Sediment AOIs

Five sediment AOIs were identified and retained for further evaluation (Table 5.10 and Figure 5.24 through Figure 5.28). These AOIs include one SVOC (benzo[a]pyrene), two metals (arsenic and chromium), and two radionuclides (americium-241 and plutonium-239/240). All of these AOIs have greater than 1 percent frequency of detection above their respective WRW PRGs at one or more locations across the site. Only arsenic and plutonium-239/240 are above 10 times the WRW PRG. A summary of the sediment AOIs by drainage basin is provided in Table 5.11. These AOIs are further evaluated in Section 8.0.

5.9 References

CDH, 1991, Project Task 1 Report (Revised 1) Identification of Chemicals and Radionuclides Used at Rocky Flats, Colorado Department of Health prepared by ChemRisk, March.

CDH, 1992, Project Tasks 3 & 4 Final Draft Report, Reconstruction of Historical Rocky Flats Operations & Identification of Release Points, prepared by ChemRisk, August 1992.

CDPHE, 2002, Corrective Action Guidance Document, Hazardous Materials and Waste Management Division, Colorado Department of Public Health and Environment, Version One, May.

CESC, 1996, Soil and Sediment Study of Off-Site Areas Surrounding the Rocky Flats Nuclear Weapons Plant, Executive Summary, Citizen's Environmental Sampling Committee, http://www.cdphe.state.co.us/rf/soilsedstudy.htm, September.

CWQCD, 1993, Guidance on Data Requirements and Data Interpretation Methods Used In Stream Standards and Classification Proceedings, July.

CWQCD, 2004, Guidance on Data Requirements and Data Interpretation Methods Used In Water Quality Standards and Classification Proceedings, August.

CWQCD, 2005, Guidance on Data Requirements and Data Interpretation Methods Used in Water Quality Standards and Classification Proceedings, March.

DOE, 1991, Environmental Regulatory Guide for Radiological Effluent Monitoring and Environment Surveillance, DOE/EH-0173T, U.S. DOE, Washington, D.C., January.

DOE, 1992, Phase I RFI/RI Work Plan for Walnut Creek Priority Drainage, Operable Unit 6, Rocky Flats Plant, Golden, Colorado, June.

DOE, 1993, Background Geochemical Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 1995, Geochemical Characterization of Background Surface Soils: Background Soils Characterization Program, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 1996, Final Phase I RFI/RI Report Walnut Creek Priority Drainage, Operable Unit 6, RF/ER-95-0119.UN, Rev 0, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2000a, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado.

DOE, 2002a, Final Work Plan for the Development of the Remedial Investigation and Feasibility Study Report, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2002b, Final Buffer Zone Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2004a, Industrial Area and Buffer Zone Sampling and Analysis Plan, Modification 1, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004b, Final Comprehensive Risk Assessment Sampling and Analysis Plan Addendum #05-01 Phase 2 – Targeted Sampling, Rocky Flats Environmental Technology Site, December.

DOE, 2005a, Final Comprehensive Risk Assessment Work Plan and Methodology, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2005b, Data Summary Report for IHSS Group NE-1, Rocky Flats Environmental Technology Site, October.

EPA, 1988, Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, October.

EPA, 1999, USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, OSWER 9240.1-05A-P, EPA-540-R-99-008, October.

EPA, 2001, USEPA Contract Laboratory Program National Functional Guidelines for Low Concentration Organic Data Review, Final, OSWER 9240.1-34, EPA-540-R-00-006, June.

EPA, 2002, Guidance for Comparing Background and Chemical Concentration in Soil for CERCLA Sites, EPA 540-R-01-003, OSWER 9285.7-41, September.

EPA, 2005, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, Draft Final, OSWER 9240.1-46, EPA-540-R-04-009, January.

K-H, 2005a, Review of Historical Knowledge Related to Metals and Selected Radionuclides Identified As Environmental Media Analytes of Interest, Rocky Flats Environmental Technology Site, Golden, Colorado, July 15.

K-H, 2005b, Integrated Monitoring Plan FY05 Summary Document, Revision 1, Rocky Flats Environmental Technology Site, September.

K-H, 2005c, Integrated Monitoring Plan FY05 Background Document, Revision 1, Rocky Flats Environmental Technology Site, September.

Table 5.1
Summary of Historical Surface Water and Sediment Monitoring Locations and Sampling Frequencies

Table 5.2
Summary Statistics for Surface Water

Table 5.3
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Summary of Sediment AOIs by Drainage Basin

Figure 5.1
Surface Water Sampling Locations

Figure 5.2
Sediment Sampling Locations

Figure 5.3
Surface Water Drainage Basins

Figure 5.4
Surface Water AOI Screening Process

Figure 5.5
Extent of Carbon Tetrachloride in Surface Water

Figure 5.6
Extent of Chloroform in Surface Water

Figure 5.7
Extent of cis-1,2-Dichloroethene in Surface Water

Figure 5.8
Extent of Methylene Chloride in Surface Water

Figure 5.9
Extent of Tetrachloroethene in Surface Water

Figure 5.10
Extent of Trichloroethene in Surface Water

Figure 5.11
Extent of Vinyl Chloride in Surface Water

Figure 5.12
Extent of Dissolved Aluminum in Surface Water

Figure 5.13
Extent of Total Beryllium in Surface Water

Figure 5.14
Extent of Total Chromium in Surface Water

Figure 5.15
Extent of Total Lead in Surface Water

Figure 5.16
Extent of Total Nickel in Surface Water

Figure 5.17
Extent of Total Americium-241 in Surface Water

Figure 5.18
Extent of Total Gross Alpha in Surface Water

Figure 5.19
Extent of Total Gross Beta in Surface Water

Figure 5.20
Extent of Total Plutonium-239/240 in Surface Water

Figure 5.21
Extent of Total Uranium Isotopes in Surface Water

Figure 5.22
Extent of Nitrate/Nitrite (as N) in Surface Water

Figure 5.23
Sediment AOI Screening Process

Figure 5.24
Extent of Benzo(a)pyrene in Sediments

Figure 5.25
Extent of Arsenic in Sediments

Figure 5.26
Extent of Chromium in Sediments

Figure 5.27
Extent of Americium-241 in Sediments

Figure 5.28
Extent of Plutonium-239/240 in Sediments

TABLES

Table 5.1
Summary of Surface Water and Sediment
Monitoring Locations and Sampling Frequencies

Station/Location[a]	Number of Samples	Sampling Period		Media
750CULVERT	104	07/03/91	12/02/94	Surface Water
771 FD OUT #2	5	03/26/99	04/26/04	Surface Water
995POE	22	11/28/00	10/24/02	Surface Water
A1	17	07/08/91	11/30/04	Surface Water
A1BYPASS	11	05/26/92	09/25/00	Surface Water
A2	28	07/08/91	05/24/05	Surface Water
A3	168	07/09/91	06/02/05	Surface Water
A3EFF	426	07/25/91	10/05/00	Surface Water
A4	176	07/02/91	03/16/05	Surface Water
A4BG	4	07/02/91	09/10/91	Surface Water
A4EFF	492	06/28/91	06/15/00	Surface Water
B1	18	07/04/91	02/17/95	Surface Water
B1-001	1	02/13/98	02/13/98	Surface Water
B1-002	1	02/13/98	02/13/98	Surface Water
B1-003	1	02/13/98	02/13/98	Surface Water
B2	22	07/04/91	05/24/95	Surface Water
B2-001	1	02/16/98	02/16/98	Surface Water
B2-002	2	02/16/98	09/23/02	Surface Water
B2-003	2	02/16/98	09/23/02	Surface Water
B3	9	07/11/91	12/16/99	Surface Water
B3-001	1	09/23/02	09/23/02	Surface Water
B371BAS	12	08/15/92	08/20/03	Surface Water
B371SUBBAS	22	03/07/92	08/20/03	Surface Water
B3EFF	564	07/01/91	10/26/00	Surface Water
B4	5	07/15/91	11/20/91	Surface Water
B4INF	1	09/16/03	09/16/03	Surface Water
B5	174	07/01/91	04/19/05	Surface Water
B5 POND	3	05/25/00	07/07/05	Surface Water
B5EFF	85	03/23/94	09/19/00	Surface Water
B5TRANS	60	07/23/91	01/19/99	Surface Water
B779RD-01	4	12/14/98	07/24/99	Surface Water
B886RD-01	4	01/23/99	07/24/99	Surface Water
BM69-001	1	12/30/04	12/30/04	Surface Water
BOWMANS POND EAST	1	04/22/99	04/22/99	Surface Water
BOWMANS POND MIDDLE	2	04/20/99	04/22/99	Surface Water
BOWMANS POND WEST	2	04/20/99	04/22/99	Surface Water
BQ49-001	1	12/29/04	12/29/04	Surface Water
BU70-001	2	12/30/04	05/31/05	Surface Water
C1	977	06/28/91	07/12/96	Surface Water
C2	137	06/28/91	11/22/04	Surface Water
C2BG	1	11/08/04	11/08/04	Surface Water
C2EFF	54	03/24/92	06/07/99	Surface Water
CC16-001	1	12/29/04	12/29/04	Surface Water
CD78-001	1	12/30/04	12/30/04	Surface Water
CG49-031	1	06/02/04	06/02/04	Surface Water

Table 5.1
Summary of Surface Water and Sediment
Monitoring Locations and Sampling Frequencies

Station/Location[a]	Number of Samples	Sampling Period		Media
CO66-000	1	01/11/05	01/11/05	Surface Water
CX19-001	1	12/29/04	12/29/04	Surface Water
D1	1	04/22/92	04/22/92	Surface Water
DO13-001	1	01/10/05	01/10/05	Surface Water
DY05-001	1	01/10/05	01/10/05	Surface Water
FD-111-1	5	03/07/92	06/01/94	Surface Water
FD-371-2	1	06/11/95	06/11/95	Surface Water
FD-371COMP	1	03/07/92	03/07/92	Surface Water
FD-444-460	8	03/07/92	03/19/95	Surface Water
FD-774-1	12	07/25/92	04/23/03	Surface Water
FD-774-2	2	06/20/02	04/24/03	Surface Water
FD-774-4	5	05/30/01	04/23/03	Surface Water
FD-774-5	3	05/30/01	04/23/03	Surface Water
FD-991-1	5	04/26/93	06/01/94	Surface Water
GS01	201	03/24/92	06/10/05	Surface Water
GS01A	2	03/17/92	04/01/92	Surface Water
GS02	13	08/08/91	04/17/98	Surface Water
GS03	290	08/28/91	07/23/05	Surface Water
GS03T	1	11/05/02	11/05/02	Surface Water
GS04	33	03/31/92	04/13/05	Surface Water
GS05	36	07/23/91	06/10/04	Surface Water
GS06	27	08/08/91	05/23/02	Surface Water
GS07	6	07/24/91	10/17/93	Surface Water
GS08	117	04/28/97	07/14/05	Surface Water
GS09	8	06/03/92	11/08/94	Surface Water
GS10	303	07/23/91	07/28/05	Surface Water
GS11	102	05/28/92	07/14/05	Surface Water
GS12	2	09/24/92	09/29/94	Surface Water
GS13	371	06/28/91	06/15/05	Surface Water
GS14	1	10/17/93	10/17/93	Surface Water
GS15	1	10/26/92	10/26/92	Surface Water
GS16	3	10/17/93	10/17/94	Surface Water
GS17	3	10/17/93	12/14/01	Surface Water
GS1704	1	06/09/04	06/09/04	Surface Water
GS18	1	10/17/93	10/17/93	Surface Water
GS21	37	05/02/94	05/03/05	Surface Water
GS22	48	05/03/95	03/15/05	Surface Water
GS24	10	05/02/95	07/09/96	Surface Water
GS25	9	05/02/95	07/09/96	Surface Water
GS26	3	04/18/95	03/14/96	Surface Water
GS27	82	05/23/95	04/10/04	Surface Water
GS28	32	05/16/95	04/11/05	Surface Water
GS29	5	05/24/96	07/09/96	Surface Water
GS30	2	05/09/96	05/24/96	Surface Water
GS31	25	01/23/97	12/13/04	Surface Water

Table 5.1
Summary of Surface Water and Sediment
Monitoring Locations and Sampling Frequencies

Station/Location[a]	Number of Samples	Sampling Period		Media
GS32	91	04/25/97	11/10/04	Surface Water
GS33	13	10/28/97	05/04/99	Surface Water
GS34	30	02/12/98	09/14/00	Surface Water
GS35	15	10/27/97	04/03/00	Surface Water
GS37	17	10/29/97	10/27/98	Surface Water
GS38	83	02/16/98	05/11/05	Surface Water
GS39	72	01/15/98	05/11/05	Surface Water
GS40	108	03/03/98	07/11/05	Surface Water
GS41	4	04/25/99	05/04/01	Surface Water
GS42	12	04/30/99	04/25/05	Surface Water
GS43	34	06/04/99	09/21/04	Surface Water
GS44	44	10/04/00	07/24/04	Surface Water
GS49	48	02/11/01	06/09/05	Surface Water
GS50	17	04/12/01	11/10/04	Surface Water
GS51	26	05/24/02	05/12/05	Surface Water
GS52	20	05/24/02	05/03/05	Surface Water
GS5204	1	06/09/04	06/09/04	Surface Water
GS53	6	03/17/03	04/12/05	Surface Water
GS54	7	03/25/03	04/30/05	Surface Water
GS55	47	04/10/02	04/27/05	Surface Water
GS56	22	03/17/03	05/18/05	Surface Water
GS57	55	04/05/02	05/30/05	Surface Water
GS58	7	03/19/02	05/23/02	Surface Water
GS59	30	11/19/02	05/31/05	Surface Water
GS60	26	08/30/03	06/10/05	Surface Water
GS61	20	10/30/03	04/12/05	Surface Water
GS61A	5	04/08/05	07/18/05	Surface Water
IHSS209	2	04/24/92	03/18/93	Surface Water
INT. DITCH	1	08/24/92	08/24/92	Surface Water
LANDFILL POND	10	07/15/91	05/24/95	Surface Water
SED00695	2	02/28/95	04/25/95	Surface Water
SED01595	1	04/25/95	04/25/95	Surface Water
SED02295	1	04/27/95	04/27/95	Surface Water
SED02695	2	02/21/95	04/25/95	Surface Water
SED02995	1	04/25/95	04/25/95	Surface Water
SED04195	2	03/17/95	04/25/95	Surface Water
SED04395	2	02/27/95	04/27/95	Surface Water
SED04595	2	02/23/95	04/28/95	Surface Water
SED04695	2	02/27/95	04/27/95	Surface Water
SED04795	1	04/27/95	04/27/95	Surface Water
SED05095	2	03/16/95	04/25/95	Surface Water
SED05395	2	02/21/95	05/02/95	Surface Water
SED05495	2	02/21/95	05/02/95	Surface Water
SED05995	1	04/28/95	04/28/95	Surface Water
SED06295	2	03/01/95	05/02/95	Surface Water

Table 5.1
Summary of Surface Water and Sediment
Monitoring Locations and Sampling Frequencies

Station/Location[a]	Number of Samples	Sampling Period		Media
SED06595	2	02/22/95	04/28/95	Surface Water
SED06695	2	02/22/95	04/28/95	Surface Water
SED06895	2	03/01/95	05/02/95	Surface Water
SED07095	2	03/15/95	04/27/95	Surface Water
SED07195	2	03/15/95	04/27/95	Surface Water
SED07395	2	02/22/95	04/28/95	Surface Water
SED07495	2	02/22/95	04/28/95	Surface Water
SED07895	2	02/23/95	04/27/95	Surface Water
SED07995	2	03/01/95	05/02/95	Surface Water
SED08195	2	03/16/95	05/02/95	Surface Water
SED08295	2	03/16/95	04/25/95	Surface Water
SED08895	2	03/16/95	04/25/95	Surface Water
SED09095	2	03/17/95	04/25/95	Surface Water
SW001	1	03/17/92	03/17/92	Surface Water
SW00196	54	05/29/96	01/20/05	Surface Water
SW00198	1	02/17/98	02/17/98	Surface Water
SW002	3	11/07/91	04/01/92	Surface Water
SW00298	1	02/17/98	02/17/98	Surface Water
SW003	5	07/22/91	02/06/92	Surface Water
SW004	3	03/30/92	03/16/93	Surface Water
SW00495	1	10/26/00	10/26/00	Surface Water
SW005	10	07/01/91	03/23/05	Surface Water
SW006	9	07/01/91	02/25/93	Surface Water
SW007	7	03/05/92	05/05/95	Surface Water
SW009	1	03/16/92	03/16/92	Surface Water
SW014	1	03/30/92	03/30/92	Surface Water
SW017	5	07/29/91	02/26/92	Surface Water
SW018	36	07/15/91	07/14/05	Surface Water
SW01893	1	11/30/93	11/30/93	Surface Water
SW019	1	07/23/91	07/23/91	Surface Water
SW020	1	07/23/91	07/23/91	Surface Water
SW021	26	04/29/00	10/21/04	Surface Water
SW022	108	07/10/91	02/15/05	Surface Water
SW023	19	07/17/91	03/07/05	Surface Water
SW024	2	05/16/95	06/16/04	Surface Water
SW026	9	07/12/91	04/25/94	Surface Water
SW027	93	07/10/91	05/02/05	Surface Water
SW028	4	07/11/91	10/09/91	Surface Water
SW029	10	07/11/91	04/25/94	Surface Water
SW030	2	08/08/91	10/03/91	Surface Water
SW031	3	08/12/91	10/16/91	Surface Water
SW032	7	07/10/91	04/02/92	Surface Water
SW033	9	07/10/91	03/24/93	Surface Water
SW034	9	07/10/91	04/25/94	Surface Water
SW035	11	07/10/91	09/26/95	Surface Water

Table 5.1
Summary of Surface Water and Sediment
Monitoring Locations and Sampling Frequencies

Station/Location[a]	Number of Samples	Sampling Period		Media
SW036	27	08/13/91	02/21/05	Surface Water
SW03604	1	06/08/04	06/08/04	Surface Water
SW038	15	07/25/91	06/08/04	Surface Water
SW039	6	07/08/91	04/15/92	Surface Water
SW040	2	11/04/92	03/24/93	Surface Water
SW041	6	07/08/91	03/24/93	Surface Water
SW044	1	07/09/91	07/09/91	Surface Water
SW046	4	07/09/91	10/17/91	Surface Water
SW050	1	03/25/92	03/25/92	Surface Water
SW051	1	03/25/92	03/25/92	Surface Water
SW052	1	03/25/92	03/25/92	Surface Water
SW053	9	07/24/91	06/29/95	Surface Water
SW054	6	07/11/91	07/20/92	Surface Water
SW055	19	07/24/91	04/23/04	Surface Water
SW056	6	07/15/91	05/13/02	Surface Water
SW057	1	03/25/92	03/25/92	Surface Water
SW058	1	03/25/92	03/25/92	Surface Water
SW059	132	08/07/91	06/04/98	Surface Water
SW060	11	07/12/91	10/22/00	Surface Water
SW061	160	07/12/91	12/27/04	Surface Water
SW062	3	08/06/91	10/09/91	Surface Water
SW063	3	08/09/91	08/30/91	Surface Water
SW064	2	08/30/91	03/26/92	Surface Water
SW068	5	07/10/91	11/30/93	Surface Water
SW069	4	07/10/91	10/10/91	Surface Water
SW070	13	07/10/91	09/26/95	Surface Water
SW077	2	08/09/91	08/30/91	Surface Water
SW080	2	12/17/92	03/03/93	Surface Water
SW083	4	03/16/92	05/05/95	Surface Water
SW084	3	07/15/91	10/07/91	Surface Water
SW085	5	05/04/01	09/10/02	Surface Water
SW086	4	07/16/91	02/12/92	Surface Water
SW089	2	05/26/93	06/18/93	Surface Water
SW090	4	07/16/91	10/08/91	Surface Water
SW091	33	05/17/95	05/11/05	Surface Water
SW092	6	07/09/91	04/25/94	Surface Water
SW093	308	07/10/91	06/22/05	Surface Water
SW093T	12	01/27/03	05/10/03	Surface Water
SW097	11	07/29/91	10/30/02	Surface Water
SW098	20	07/23/91	11/10/97	Surface Water
SW099	10	07/02/91	04/02/03	Surface Water
SW100	4	03/02/92	04/02/03	Surface Water
SW100100	5	04/29/00	10/22/00	Surface Water
SW101	3	07/16/91	02/10/92	Surface Water
SW10100	1	06/28/00	06/28/00	Surface Water

Table 5.1
Summary of Surface Water and Sediment
Monitoring Locations and Sampling Frequencies

Station/Location[a]	Number of Samples	Sampling Period		Media
SW10195	1	06/30/95	06/30/95	Surface Water
SW10200	1	06/28/00	06/28/00	Surface Water
SW10295	1	07/03/95	07/03/95	Surface Water
SW10300	2	06/29/00	03/15/01	Surface Water
SW10395	1	06/30/95	06/30/95	Surface Water
SW104	1	06/15/92	06/15/92	Surface Water
SW10495	1	06/30/95	06/30/95	Surface Water
SW105	5	07/16/91	02/10/92	Surface Water
SW10595	1	06/28/95	06/28/95	Surface Water
SW106	1	09/09/91	09/09/91	Surface Water
SW10695	1	06/28/95	06/28/95	Surface Water
SW107	7	07/01/91	04/25/94	Surface Water
SW10795	1	07/03/95	07/03/95	Surface Water
SW108	5	07/01/91	03/16/93	Surface Water
SW10895	1	06/30/95	06/30/95	Surface Water
SW109	2	05/01/95	05/05/95	Surface Water
SW10995	1	06/30/95	06/30/95	Surface Water
SW11095	1	06/28/95	06/28/95	Surface Water
SW116	4	07/23/91	03/16/92	Surface Water
SW117	1	03/12/92	03/12/92	Surface Water
SW118	45	07/10/91	12/14/01	Surface Water
SW11804	2	06/14/04	12/03/04	Surface Water
SW118-P	2	08/24/92	08/26/92	Surface Water
SW118-S	2	08/24/92	08/26/92	Surface Water
SW119	25	04/11/01	10/13/04	Surface Water
SW120	43	03/22/00	02/23/05	Surface Water
SW122	5	07/15/91	02/10/92	Surface Water
SW127	7	08/01/91	04/25/94	Surface Water
SW128	5	07/24/91	03/16/92	Surface Water
SW129	4	07/22/91	10/23/91	Surface Water
SW130	6	08/01/91	03/01/93	Surface Water
SW131	5	07/08/91	12/17/92	Surface Water
SW132	169	07/22/91	12/27/04	Surface Water
SW134	36	03/23/92	07/14/04	Surface Water
SW135	2	03/23/92	02/25/93	Surface Water
SW136	2	03/19/92	03/22/93	Surface Water
SW137	2	03/19/92	03/22/93	Surface Water
SW20105	4	12/04/04	12/21/04	Surface Water
SW20205	1	12/03/04	12/03/04	Surface Water
SW20305	1	12/04/04	12/04/04	Surface Water
SW20405	1	12/04/04	12/04/04	Surface Water
SW20505	1	12/04/04	12/04/04	Surface Water
SW20605	1	12/04/04	12/04/04	Surface Water
SW20705	1	12/04/04	12/04/04	Surface Water
SW20805	1	12/04/04	12/04/04	Surface Water

Table 5.1
Summary of Surface Water and Sediment
Monitoring Locations and Sampling Frequencies

Station/Location[a]	Number of Samples	Sampling Period		Media
SW20905	1	12/04/04	12/04/04	Surface Water
SW21005	2	12/04/04	01/17/05	Surface Water
SW30195	1	05/17/95	05/17/95	Surface Water
SW30295	1	05/17/95	05/17/95	Surface Water
SW30395	1	05/17/95	05/17/95	Surface Water
SW30495	1	05/17/95	05/17/95	Surface Water
SW30595	1	05/17/95	05/17/95	Surface Water
SW30695	1	05/17/95	05/17/95	Surface Water
SW30795	1	05/17/95	05/17/95	Surface Water
SW30895	1	05/17/95	05/17/95	Surface Water
SW30995	1	05/17/95	05/17/95	Surface Water
SW31095	1	05/17/95	05/17/95	Surface Water
SW31195	1	05/17/95	05/17/95	Surface Water
SW31295	1	05/17/95	05/17/95	Surface Water
SW31395	1	05/17/95	05/17/95	Surface Water
SW31495	1	05/17/95	05/17/95	Surface Water
SW31595	1	05/17/95	05/17/95	Surface Water
SW31695	1	05/17/95	05/17/95	Surface Water
SW31795	1	05/24/95	05/24/95	Surface Water
SW31895	1	06/09/95	06/09/95	Surface Water
SW33195	1	06/09/95	06/09/95	Surface Water
SW33503	1	01/15/04	01/15/04	Surface Water
SW34495	1	06/29/95	06/29/95	Surface Water
SW500	1	10/05/92	10/05/92	Surface Water
SW501	3	11/04/92	04/25/94	Surface Water
SW50193	1	03/24/93	03/24/93	Surface Water
SW50293	1	03/24/93	03/24/93	Surface Water
SW506	3	11/04/92	04/25/94	Surface Water
SW50604	1	06/10/04	06/10/04	Surface Water
SW507	3	03/24/93	05/17/93	Surface Water
SW51104	1	06/09/04	06/09/04	Surface Water
SW55193	1	05/24/93	05/24/93	Surface Water
SW60092	1	09/16/92	09/16/92	Surface Water
SW60192	1	09/17/92	09/17/92	Surface Water
SW60292	1	09/16/92	09/16/92	Surface Water
SW60392	1	09/17/92	09/17/92	Surface Water
SW60492	1	09/17/92	09/17/92	Surface Water
SW60592	1	09/16/92	09/16/92	Surface Water
SW60692	1	09/16/92	09/16/92	Surface Water
SW60792	1	09/10/92	09/10/92	Surface Water
SW60892	1	09/16/92	09/16/92	Surface Water
SW60992	1	09/15/92	09/15/92	Surface Water
SW61092	1	09/10/92	09/10/92	Surface Water
SW61192	1	09/10/92	09/10/92	Surface Water
SW61292	1	09/09/92	09/09/92	Surface Water

Table 5.1
Summary of Surface Water and Sediment
Monitoring Locations and Sampling Frequencies

Station/Location[a]	Number of Samples	Sampling Period		Media
SW61392	1	09/09/92	09/09/92	Surface Water
SW61492	1	09/10/92	09/10/92	Surface Water
SW61592	1	09/02/92	09/02/92	Surface Water
SW61692	1	09/02/92	09/02/92	Surface Water
SW61792	1	09/03/92	09/03/92	Surface Water
SW61892	1	09/03/92	09/03/92	Surface Water
SW61992	1	09/03/92	09/03/92	Surface Water
SW62092	1	09/21/92	09/21/92	Surface Water
SW62192	1	09/21/92	09/21/92	Surface Water
SW62292	1	09/21/92	09/21/92	Surface Water
SW62392	1	09/23/92	09/23/92	Surface Water
SW62492	1	09/21/92	09/21/92	Surface Water
SW62592	1	09/23/92	09/23/92	Surface Water
SW62692	1	09/24/92	09/24/92	Surface Water
SW62792	1	09/23/92	09/23/92	Surface Water
SW62892	1	09/23/92	09/23/92	Surface Water
SW62992	1	09/24/92	09/24/92	Surface Water
SW63092	1	10/05/92	10/05/92	Surface Water
SW63192	1	10/05/92	10/05/92	Surface Water
SW63292	1	10/05/92	10/05/92	Surface Water
SW63392	1	10/05/92	10/05/92	Surface Water
SW63492	1	10/05/92	10/05/92	Surface Water
SW63592	1	10/01/92	10/01/92	Surface Water
SW63692	1	10/01/92	10/01/92	Surface Water
SW63792	1	10/01/92	10/01/92	Surface Water
SW63892	1	10/01/92	10/01/92	Surface Water
SW63992	1	10/01/92	10/01/92	Surface Water
SW64092	1	09/28/92	09/28/92	Surface Water
SW64192	1	09/28/92	09/28/92	Surface Water
SW64292	1	09/24/92	09/24/92	Surface Water
SW64392	1	09/28/92	09/28/92	Surface Water
SW64492	2	09/28/92	09/16/03	Surface Water
SW64592	1	09/02/92	09/02/92	Surface Water
SW64692	1	09/02/92	09/02/92	Surface Water
SW64792	1	09/01/92	09/01/92	Surface Water
SW64892	1	09/02/92	09/02/92	Surface Water
SW64992	1	09/01/92	09/01/92	Surface Water
SW67093	1	04/05/93	04/05/93	Surface Water
SW67193	1	04/05/93	04/05/93	Surface Water
SW67393	1	04/05/93	04/05/93	Surface Water
SW67493	1	04/05/93	04/05/93	Surface Water
SW67593	1	04/06/93	04/06/93	Surface Water
SW67693	1	04/06/93	04/06/93	Surface Water
SW67893	1	04/06/93	04/06/93	Surface Water
SW67993	1	04/06/93	04/06/93	Surface Water

Table 5.1
Summary of Surface Water and Sediment
Monitoring Locations and Sampling Frequencies

Station/Location[a]	Number of Samples	Sampling Period		Media
SW68093	1	04/07/93	04/07/93	Surface Water
SW68193	1	04/06/93	04/06/93	Surface Water
SW68293	1	04/06/93	04/06/93	Surface Water
SW68593	1	05/17/93	05/17/93	Surface Water
SW68693	1	05/17/93	05/17/93	Surface Water
SW68793	1	05/17/93	05/17/93	Surface Water
SW68893	1	05/17/93	05/17/93	Surface Water
SW68993	1	05/17/93	05/17/93	Surface Water
SW69093	1	05/17/93	05/17/93	Surface Water
SW69293	1	05/17/93	05/17/93	Surface Water
SW998	19	08/24/92	07/09/96	Surface Water
SWA104	1	06/14/04	06/14/04	Surface Water
SWA204	1	06/14/04	06/14/04	Surface Water
SWA3	1	12/11/91	12/11/91	Surface Water
SWA304	1	06/14/04	06/14/04	Surface Water
SWA4	1	12/17/91	12/17/91	Surface Water
SWA404	1	06/14/04	06/14/04	Surface Water
SWB1	1	12/11/91	12/11/91	Surface Water
SWB104	1	06/16/04	06/16/04	Surface Water
SWB2	2	12/11/91	09/23/02	Surface Water
SWB204	1	06/16/04	06/16/04	Surface Water
SWB3	1	12/16/91	12/16/91	Surface Water
SWB304	1	06/16/04	06/16/04	Surface Water
SWB3B4	1	06/16/04	06/16/04	Surface Water
SWB4	2	12/16/91	09/16/03	Surface Water
SWB403	1	09/16/03	09/16/03	Surface Water
SWB404	1	06/16/04	06/16/04	Surface Water
SWB5	1	09/16/03	09/16/03	Surface Water
SWB504	1	06/15/04	06/15/04	Surface Water
SWC104	1	06/09/04	06/09/04	Surface Water
SWC2	1	12/12/91	12/12/91	Surface Water
SWC204	1	06/08/04	06/08/04	Surface Water
SWLF04	1	06/16/04	06/16/04	Surface Water
SWMP04	1	06/16/04	06/16/04	Surface Water
SWNWC04	1	06/09/04	06/09/04	Surface Water
SWWC104	1	06/09/04	06/09/04	Surface Water
SWWC204	1	06/09/04	06/09/04	Surface Water
W+I	868	06/28/91	10/05/04	Surface Water
WC-CULVERT	1	02/16/98	02/16/98	Surface Water
090100	1	12/27/99	12/27/99	Sediment
090200	1	12/27/99	12/27/99	Sediment
090300	1	12/27/99	12/27/99	Sediment
10199	1	04/20/99	04/20/99	Sediment
10299	1	04/21/99	04/21/99	Sediment
10399	1	04/21/99	04/21/99	Sediment

Table 5.1
Summary of Surface Water and Sediment
Monitoring Locations and Sampling Frequencies

Station/Location[a]	Number of Samples	Sampling Period		Media
11199	2	04/20/99	04/28/99	Sediment
124POND	1	05/13/94	05/13/94	Sediment
13090299	1	06/17/99	06/17/99	Sediment
15197	1	08/21/97	08/21/97	Sediment
15297	1	08/21/97	08/21/97	Sediment
15397	1	08/21/97	08/21/97	Sediment
15497	1	08/21/97	08/21/97	Sediment
15597	1	08/21/97	08/21/97	Sediment
15697	1	08/21/97	08/21/97	Sediment
15797	1	08/21/97	08/21/97	Sediment
15897	1	08/21/97	08/21/97	Sediment
15997	1	08/21/97	08/21/97	Sediment
16097	1	08/21/97	08/21/97	Sediment
16197	1	08/21/97	08/21/97	Sediment
16297	1	08/21/97	08/21/97	Sediment
16397	1	08/21/97	08/21/97	Sediment
16497	1	08/21/97	08/21/97	Sediment
16597	1	08/21/97	08/21/97	Sediment
16697	1	08/21/97	08/21/97	Sediment
16797	1	08/21/97	08/21/97	Sediment
16897	1	08/21/97	08/21/97	Sediment
16997	1	08/21/97	08/21/97	Sediment
A4	1	05/04/92	05/04/92	Sediment
B123 METAL MANHOLE	1	03/11/02	03/11/02	Sediment
B5	1	05/04/92	05/04/92	Sediment
B5 OUTLET (N)	1	10/13/97	10/13/97	Sediment
B5 OUTLET (S)	1	10/13/97	10/13/97	Sediment
BD08-000	1	12/29/04	12/29/04	Sediment
BM69-000	1	12/30/04	12/30/04	Sediment
BQ49-000	1	12/29/04	12/29/04	Sediment
BU70-000	1	12/30/04	12/30/04	Sediment
BW35-067	1	07/20/05	07/20/05	Sediment
BZ35-003-01	1	06/26/03	06/26/03	Sediment
C1	1	05/05/92	05/05/92	Sediment
C2	1	05/04/92	05/04/92	Sediment
CC16-000	1	12/29/04	12/29/04	Sediment
CD78-000	1	12/30/04	12/30/04	Sediment
CG49-018	1	05/24/04	05/24/04	Sediment
CG49-021	1	05/24/04	05/24/04	Sediment
CG57-000	1	01/04/05	01/04/05	Sediment
CH49-017	1	05/25/04	05/25/04	Sediment
CH49-018	1	05/25/04	05/25/04	Sediment
CH49-019	1	05/25/04	05/25/04	Sediment
CH49-025	1	06/02/04	06/02/04	Sediment
CH57-000	1	01/04/05	01/04/05	Sediment

Table 5.1
Summary of Surface Water and Sediment
Monitoring Locations and Sampling Frequencies

Station/Location[a]	Number of Samples	Sampling Period		Media
CI38-022	1	05/29/02	05/29/02	Sediment
CI48-000	1	08/23/02	08/23/02	Sediment
CI57-000	1	01/04/05	01/04/05	Sediment
CI57-001	1	01/04/05	01/04/05	Sediment
CI58-000	1	01/04/05	01/04/05	Sediment
CI58-001	1	01/04/05	01/04/05	Sediment
CI58-002	1	01/04/05	01/04/05	Sediment
CI58-003	1	01/04/05	01/04/05	Sediment
CJ41-004	1	09/16/04	09/16/04	Sediment
CJ42-006	1	09/16/04	09/16/04	Sediment
CJ42-007	1	09/16/04	09/16/04	Sediment
CJ42-008	1	09/16/04	09/16/04	Sediment
CJ43-009	1	09/16/04	09/16/04	Sediment
CJ43-010	1	09/16/04	09/16/04	Sediment
CJ43-011	1	09/28/04	09/28/04	Sediment
CJ58-000	1	01/04/05	01/04/05	Sediment
CJ58-001	1	01/04/05	01/04/05	Sediment
CM37-031	1	02/06/03	02/06/03	Sediment
CM37-032	1	02/06/03	02/06/03	Sediment
CN37-012	1	02/10/03	02/10/03	Sediment
CN38-016	1	02/06/03	02/06/03	Sediment
CN38-017	1	02/06/03	02/06/03	Sediment
CN66-000	1	12/29/04	12/29/04	Sediment
CP46-000	1	11/12/02	11/12/02	Sediment
CR31-004	1	01/04/05	01/04/05	Sediment
CR31-005	1	07/19/05	07/19/05	Sediment
CR31-006	1	07/19/05	07/19/05	Sediment
CR31-007	1	07/19/05	07/19/05	Sediment
CR31-008	1	07/20/05	07/20/05	Sediment
CR32-001	1	09/26/02	09/26/02	Sediment
CR53-000	1	07/07/05	07/07/05	Sediment
CS53-000	1	12/21/04	12/21/04	Sediment
CS53-001	1	07/07/05	07/07/05	Sediment
CS53-002	1	07/07/05	07/07/05	Sediment
CS53-003	1	07/07/05	07/07/05	Sediment
CV54-000	1	07/19/05	07/19/05	Sediment
CW53-000	1	07/18/05	07/18/05	Sediment
CW54-000	1	12/22/04	12/22/04	Sediment
CW54-002	1	07/18/05	07/18/05	Sediment
CX19-000	1	12/29/04	12/29/04	Sediment
CX32-002	1	08/19/04	08/19/04	Sediment
DA54-000	1	07/29/05	07/29/05	Sediment
DA55-001	1	07/29/05	07/29/05	Sediment
DB47-000	1	07/14/05	07/14/05	Sediment
DB47-001	1	07/15/05	07/15/05	Sediment

Table 5.1
Summary of Surface Water and Sediment
Monitoring Locations and Sampling Frequencies

Station/Location[a]	Number of Samples	Sampling Period		Media
DB47-002	1	07/18/05	07/18/05	Sediment
DB47-003	1	07/14/05	07/14/05	Sediment
DB47-004	1	07/14/05	07/14/05	Sediment
DB47-005	1	07/15/05	07/15/05	Sediment
DB47-006	1	08/22/05	08/22/05	Sediment
DB55-000	1	07/28/05	07/28/05	Sediment
DC45-000	1	04/16/02	04/16/02	Sediment
DC55-000	1	07/29/05	07/29/05	Sediment
DD31-000	1	07/12/05	07/12/05	Sediment
DE30-000	1	07/12/05	07/12/05	Sediment
DE31-000	1	07/12/05	07/12/05	Sediment
DF29-000	1	07/12/05	07/12/05	Sediment
DF30-000	1	07/12/05	07/12/05	Sediment
DF51-000	1	07/27/05	07/27/05	Sediment
DF57-000	1	07/21/05	07/21/05	Sediment
DG52-000	1	07/27/05	07/27/05	Sediment
DG52-001	1	07/27/05	07/27/05	Sediment
DG57-000	1	07/21/05	07/21/05	Sediment
DG58-000	1	07/21/05	07/21/05	Sediment
DH52-000	1	07/27/05	07/27/05	Sediment
DH53-000	1	07/26/05	07/26/05	Sediment
DI57-000	1	07/21/05	07/21/05	Sediment
DI58-000	1	07/21/05	07/21/05	Sediment
DO13-000	1	01/10/05	01/10/05	Sediment
DY05-000	1	01/10/05	01/10/05	Sediment
EB61-000	1	07/13/05	07/13/05	Sediment
EC61-000	1	07/13/05	07/13/05	Sediment
EC61-001	1	07/13/05	07/13/05	Sediment
SED00001	1	05/07/97	05/07/97	Sediment
SED001	2	11/12/91	04/01/92	Sediment
SED0010101	1	01/23/01	01/23/01	Sediment
SED0010400	1	06/20/00	06/20/00	Sediment
SED001900	1	09/26/00	09/26/00	Sediment
SED002	4	09/03/91	04/01/92	Sediment
SED0020101	1	01/23/01	01/23/01	Sediment
SED0020400	1	06/20/00	06/20/00	Sediment
SED002900	1	09/26/00	09/26/00	Sediment
SED0030101	1	01/23/01	01/23/01	Sediment
SED0030400	1	06/20/00	06/20/00	Sediment
SED003900	1	09/26/00	09/26/00	Sediment
SED004	6	08/05/91	03/01/93	Sediment
SED0040101	1	01/23/01	01/23/01	Sediment
SED0040400	1	06/20/00	06/20/00	Sediment
SED004900	1	09/26/00	09/26/00	Sediment
SED0050101	1	01/23/01	01/23/01	Sediment

Table 5.1
Summary of Surface Water and Sediment
Monitoring Locations and Sampling Frequencies

Station/Location[a]	Number of Samples	Sampling Period		Media
SED0050400	1	06/20/00	06/20/00	Sediment
SED005900	1	09/26/00	09/26/00	Sediment
SED006	3	08/26/91	03/04/92	Sediment
SED0060101	1	01/23/01	01/23/01	Sediment
SED0060400	1	06/20/00	06/20/00	Sediment
SED0070101	1	01/23/01	01/23/01	Sediment
SED0070400	1	06/20/00	06/20/00	Sediment
SED00795	1	02/14/95	02/14/95	Sediment
SED008	4	08/27/91	03/04/92	Sediment
SED0080400	1	06/20/00	06/20/00	Sediment
SED009	3	08/27/91	02/26/92	Sediment
SED0090400	1	06/20/00	06/20/00	Sediment
SED0100400	1	06/20/00	06/20/00	Sediment
SED01095	1	02/14/95	02/14/95	Sediment
SED011	6	09/03/91	06/20/00	Sediment
SED0110400	1	06/20/00	06/20/00	Sediment
SED01195	1	02/14/95	02/14/95	Sediment
SED0120400	1	06/20/00	06/20/00	Sediment
SED01295	1	02/14/95	02/14/95	Sediment
SED0130400	1	06/20/00	06/20/00	Sediment
SED0140400	1	06/20/00	06/20/00	Sediment
SED0150400	1	06/20/00	06/20/00	Sediment
SED016	6	08/14/91	03/18/93	Sediment
SED017	2	08/05/91	11/05/92	Sediment
SED018	2	11/18/91	03/03/93	Sediment
SED019	1	11/18/91	11/18/91	Sediment
SED020	6	08/05/91	03/18/93	Sediment
SED021	4	08/26/91	03/16/93	Sediment
SED022	2	08/26/91	12/09/91	Sediment
SED0220400	1	06/20/00	06/20/00	Sediment
SED023	4	08/05/91	03/31/93	Sediment
SED0230400	1	06/20/00	06/20/00	Sediment
SED024	4	09/03/91	11/05/92	Sediment
SED02495	1	03/10/95	03/10/95	Sediment
SED025	2	08/12/91	11/05/92	Sediment
SED0250400	1	06/20/00	06/20/00	Sediment
SED02595	1	03/10/95	03/10/95	Sediment
SED026	1	08/21/91	08/21/91	Sediment
SED02695	1	02/21/95	02/21/95	Sediment
SED027	5	08/28/91	11/05/92	Sediment
SED0270400	1	06/20/00	06/20/00	Sediment
SED02795	1	03/10/95	03/10/95	Sediment
SED028	1	08/28/91	08/28/91	Sediment
SED029	4	09/04/91	07/20/92	Sediment
SED030	1	08/21/91	08/21/91	Sediment

Table 5.1
Summary of Surface Water and Sediment
Monitoring Locations and Sampling Frequencies

Station/Location[a]	Number of Samples	Sampling Period		Media
SED031	1	08/21/91	08/21/91	Sediment
SED0320400	1	06/20/00	06/20/00	Sediment
SED03295	1	02/15/95	02/15/95	Sediment
SED0330400	1	06/20/00	06/20/00	Sediment
SED034	1	08/27/91	08/27/91	Sediment
SED0340400	1	06/20/00	06/20/00	Sediment
SED03495	1	03/14/95	03/14/95	Sediment
SED0350400	1	06/20/00	06/20/00	Sediment
SED036	1	08/26/91	08/26/91	Sediment
SED03695	1	03/02/95	03/02/95	Sediment
SED037	2	11/06/91	04/08/92	Sediment
SED038	1	11/05/91	11/05/91	Sediment
SED039	3	11/05/91	07/20/92	Sediment
SED0390400	1	06/20/00	06/20/00	Sediment
SED040	1	02/24/92	02/24/92	Sediment
SED041	1	02/24/92	02/24/92	Sediment
SED0410400	1	06/20/00	06/20/00	Sediment
SED0430400	1	06/20/00	06/20/00	Sediment
SED04395	1	02/27/95	02/27/95	Sediment
SED04492	1	06/05/92	06/05/92	Sediment
SED04495	1	02/27/95	02/27/95	Sediment
SED04795	1	03/15/95	03/15/95	Sediment
SED04895	1	03/03/95	03/03/95	Sediment
SED05095	1	03/16/95	03/16/95	Sediment
SED05195	1	03/16/95	03/16/95	Sediment
SED05295	1	03/16/95	03/16/95	Sediment
SED05395	1	02/21/95	02/21/95	Sediment
SED05795	1	02/15/95	02/15/95	Sediment
SED06095	1	02/24/95	02/24/95	Sediment
SED06195	1	02/24/95	02/24/95	Sediment
SED06295	1	03/01/95	03/01/95	Sediment
SED06695	1	02/22/95	02/22/95	Sediment
SED06895	1	03/01/95	03/01/95	Sediment
SED06995	1	03/03/95	03/03/95	Sediment
SED07095	1	03/15/95	03/15/95	Sediment
SED07295	1	03/15/95	03/15/95	Sediment
SED07495	1	02/22/95	02/22/95	Sediment
SED07595	1	03/03/95	03/03/95	Sediment
SED07695	1	03/03/95	03/03/95	Sediment
SED07995	1	03/01/95	03/01/95	Sediment
SED08195	1	03/16/95	03/16/95	Sediment
SED08295	1	03/16/95	03/16/95	Sediment
SED08395	1	02/20/95	02/20/95	Sediment
SED08495	1	02/20/95	02/20/95	Sediment
SED08895	1	03/16/95	03/16/95	Sediment

Table 5.1
Summary of Surface Water and Sediment
Monitoring Locations and Sampling Frequencies

Station/Location[a]	Number of Samples	Sampling Period		Media
SED09195	1	03/15/95	03/15/95	Sediment
SED09295	1	03/02/95	03/02/95	Sediment
SED09395	1	03/02/95	03/02/95	Sediment
SED09495	1	03/02/95	03/02/95	Sediment
SED09595	1	03/02/95	03/02/95	Sediment
SED10101	1	02/07/01	02/07/01	Sediment
SED11004	1	09/16/04	09/16/04	Sediment
SED116	1	09/04/91	09/04/91	Sediment
SED117	3	08/13/91	02/27/92	Sediment
SED118	4	08/13/91	11/18/04	Sediment
SED120	1	08/20/91	08/20/91	Sediment
SED125	1	08/14/91	08/14/91	Sediment
SED126	1	08/28/91	08/28/91	Sediment
SED127	2	12/08/92	03/18/93	Sediment
SED20104	1	11/18/04	11/18/04	Sediment
SED20193	1	05/31/94	05/31/94	Sediment
SED20204	1	11/18/04	11/18/04	Sediment
SED20293	1	05/31/94	05/31/94	Sediment
SED20304	1	11/18/04	11/18/04	Sediment
SED20393	1	05/19/94	05/19/94	Sediment
SED20493	1	04/06/94	04/06/94	Sediment
SED20593	1	04/06/94	04/06/94	Sediment
SED20693	1	04/06/94	04/06/94	Sediment
SED20793	1	04/07/94	04/07/94	Sediment
SED20893	1	03/21/94	03/21/94	Sediment
SED20993	1	03/21/94	03/21/94	Sediment
SED21093	1	03/21/94	03/21/94	Sediment
SED21193	1	03/21/94	03/21/94	Sediment
SED21293	1	04/11/94	04/11/94	Sediment
SED21393	1	04/11/94	04/11/94	Sediment
SED21493	1	04/05/94	04/05/94	Sediment
SED21593	1	04/05/94	04/05/94	Sediment
SED21693	1	04/05/94	04/05/94	Sediment
SED40100	1	10/03/00	10/03/00	Sediment
SED40196	1	02/13/96	02/13/96	Sediment
SED40200	1	10/03/00	10/03/00	Sediment
SED40296	1	02/13/96	02/13/96	Sediment
SED40300	1	10/03/00	10/03/00	Sediment
SED40396	1	02/13/96	02/13/96	Sediment
SED40500	1	10/03/00	10/03/00	Sediment
SED40600	1	10/03/00	10/03/00	Sediment
SED40700	1	10/03/00	10/03/00	Sediment
SED40800	1	10/04/00	10/04/00	Sediment
SED40900	1	10/04/00	10/04/00	Sediment
SED41000	1	10/03/00	10/03/00	Sediment

Table 5.1
Summary of Surface Water and Sediment
Monitoring Locations and Sampling Frequencies

Station/Location[a]	Number of Samples	Sampling Period		Media
SED41100	1	10/04/00	10/04/00	Sediment
SED41200	1	10/04/00	10/04/00	Sediment
SED41300	1	10/04/00	10/04/00	Sediment
SED41400	1	10/04/00	10/04/00	Sediment
SED41500	1	10/04/00	10/04/00	Sediment
SED41600	1	10/04/00	10/04/00	Sediment
SED41700	1	10/03/00	10/03/00	Sediment
SED41800	1	10/03/00	10/03/00	Sediment
SED41900	1	10/03/00	10/03/00	Sediment
SED42000	1	10/03/00	10/03/00	Sediment
SED42100	1	10/04/00	10/04/00	Sediment
SED42200	1	10/04/00	10/04/00	Sediment
SED42300	1	10/04/00	10/04/00	Sediment
SED42400	1	10/04/00	10/04/00	Sediment
SED42500	1	10/10/00	10/10/00	Sediment
SED42600	1	10/10/00	10/10/00	Sediment
SED42700	1	10/10/00	10/10/00	Sediment
SED42800	1	10/11/00	10/11/00	Sediment
SED42900	1	10/11/00	10/11/00	Sediment
SED43000	1	10/11/00	10/11/00	Sediment
SED43100	1	10/10/00	10/10/00	Sediment
SED43200	1	10/10/00	10/10/00	Sediment
SED43300	1	10/10/00	10/10/00	Sediment
SED43400	1	10/03/00	10/03/00	Sediment
SED43500	1	10/03/00	10/03/00	Sediment
SED501	1	11/05/92	11/05/92	Sediment
SED506	1	11/05/92	11/05/92	Sediment
SED507	1	11/05/92	11/05/92	Sediment
SED508	1	11/09/92	11/09/92	Sediment
SED509	1	11/09/92	11/09/92	Sediment
SED510	1	11/09/92	11/09/92	Sediment
SED511	1	11/10/92	11/10/92	Sediment
SED512	1	11/10/92	11/10/92	Sediment
SED513	1	11/10/92	11/10/92	Sediment
SED51593	1	07/08/93	07/08/93	Sediment
SED51693	1	07/08/93	07/08/93	Sediment
SED51793	1	07/08/93	07/08/93	Sediment
SED51893	1	07/08/93	07/08/93	Sediment
SED60092	2	10/29/92	06/06/94	Sediment
SED60192	2	11/02/92	06/06/94	Sediment
SED60292	2	10/29/92	06/06/94	Sediment
SED60392	2	10/29/92	06/06/94	Sediment
SED60492	2	11/02/92	06/06/94	Sediment
SED60592	2	11/12/92	06/01/94	Sediment
SED60692	2	11/12/92	06/01/94	Sediment

Table 5.1
Summary of Surface Water and Sediment
Monitoring Locations and Sampling Frequencies

Station/Location[a]	Number of Samples	Sampling Period		Media
SED60792	2	11/12/92	06/01/94	Sediment
SED60892	2	11/12/92	06/01/94	Sediment
SED60992	2	11/12/92	06/01/94	Sediment
SED61092	2	10/21/92	06/21/94	Sediment
SED61192	2	10/21/92	06/21/94	Sediment
SED61292	2	10/22/92	06/21/94	Sediment
SED61392	2	10/21/92	06/21/94	Sediment
SED61492	2	10/22/92	06/21/94	Sediment
SED61592	2	10/14/92	07/05/94	Sediment
SED61692	2	10/15/92	07/05/94	Sediment
SED61792	2	10/15/92	07/06/94	Sediment
SED61892	2	10/19/92	07/05/94	Sediment
SED61992	2	10/15/92	07/06/94	Sediment
SED63592	2	10/22/92	06/08/94	Sediment
SED63692	2	10/26/92	06/08/94	Sediment
SED63792	2	10/26/92	06/08/94	Sediment
SED63892	2	10/22/92	06/08/94	Sediment
SED63992	2	10/26/92	06/08/94	Sediment
SED64092	2	10/19/92	06/10/94	Sediment
SED64192	2	10/19/92	06/15/94	Sediment
SED64292	2	10/20/92	06/15/94	Sediment
SED64392	2	10/20/92	06/15/94	Sediment
SED64492	2	10/20/92	06/10/94	Sediment
SED64592	1	11/19/92	11/19/92	Sediment
SED64692	1	11/19/92	11/19/92	Sediment
SED64792	1	11/19/92	11/19/92	Sediment
SED64892	1	11/19/92	11/19/92	Sediment
SED64992	1	11/19/92	11/19/92	Sediment
SED65092	1	02/11/93	02/11/93	Sediment
SED65192	1	02/11/93	02/11/93	Sediment
SED65292	1	02/11/93	02/11/93	Sediment
SED65392	1	02/11/93	02/11/93	Sediment
SED65492	1	02/11/93	02/11/93	Sediment
SED65592	1	02/11/93	02/11/93	Sediment
SED65692	1	02/11/93	02/11/93	Sediment
SED65792	1	02/11/93	02/11/93	Sediment
SED65992	1	02/17/93	02/17/93	Sediment
SED66492	1	02/18/93	02/18/93	Sediment
SED66592	1	02/18/93	02/18/93	Sediment
SED66692	1	02/18/93	02/18/93	Sediment
SED66792	1	02/18/93	02/18/93	Sediment
SED68192	1	02/19/93	02/19/93	Sediment
SED68492	1	05/06/93	05/06/93	Sediment
SED68592	1	05/06/93	05/06/93	Sediment
SED68692	1	05/06/93	05/06/93	Sediment

Table 5.1
Summary of Surface Water and Sediment
Monitoring Locations and Sampling Frequencies

Station/Location[a]	Number of Samples	Sampling Period		Media
SED68792	1	05/06/93	05/06/93	Sediment
SED68892	1	05/06/93	05/06/93	Sediment
SED68992	1	05/07/93	05/07/93	Sediment
SED69292	1	05/07/93	05/07/93	Sediment
SED69392	1	05/10/93	05/10/93	Sediment
SED69492	1	05/10/93	05/10/93	Sediment
SED69692	1	05/10/93	05/10/93	Sediment
SED69792	1	05/10/93	05/10/93	Sediment
SED69892	1	05/10/93	05/10/93	Sediment
SED69992	1	05/10/93	05/10/93	Sediment
SED70092	1	05/10/93	05/10/93	Sediment
SED750101	1	01/25/01	01/25/01	Sediment
SED750201	1	01/25/01	01/25/01	Sediment
SED750301	1	01/25/01	01/25/01	Sediment
SED750401	1	01/25/01	01/25/01	Sediment
SED750501	1	01/25/01	01/25/01	Sediment
SED80093	1	12/12/94	12/12/94	Sediment
SED80193	1	12/12/94	12/12/94	Sediment
SED80393	1	12/13/94	12/13/94	Sediment
SED80693	1	12/13/94	12/13/94	Sediment
SS120194	1	10/11/94	10/11/94	Sediment
SS204293	1	03/25/93	03/25/93	Sediment
SS224293	1	03/07/94	03/07/94	Sediment
SS305493	1	06/20/94	06/20/94	Sediment
SS30599	1	12/14/98	12/14/98	Sediment
SS306693	1	06/29/94	06/29/94	Sediment
SS441494	1	09/07/94	09/07/94	Sediment
SS460394	1	10/10/94	10/10/94	Sediment
SS614792	1	10/06/92	10/06/92	Sediment
SS711193	2	12/11/92	04/08/93	Sediment
SS711593	1	12/18/92	12/18/92	Sediment
SS9040400	1	02/28/00	02/28/00	Sediment
SW01793	1	11/29/93	11/29/93	Sediment
SW022	1	06/21/94	06/21/94	Sediment
SW030	1	11/29/93	11/29/93	Sediment
SW036	1	11/29/93	11/29/93	Sediment

[a] See Figures 5.1 and 5.2 for surface water and sediment monitoring locations, respectively.

Table 5.2
Summary Statistics for Surface Water

Analyte	Total or Dissolved	Derived CAS No.	Range of Reported Values for Nondetects	Total Number of Samples	Total Number of Detects	Detection Frequency (%)	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation	Background M2SD	Lowest Standard
Herbicides (ug/L)												
4-Nitrophenol	Total	100-02-7	2.60E+01 - 8.40E+01	30	0	0.00			2.59E+01	4.61E+00		5.60E+01
Metals (ug/L)												
Aluminum	Dissolved	7429-90-5	1.30E+00 - 4.03E+01	73	34	46.58	5.1	1330	4.95E+01	1.89E+02	4.30E+02	8.70E+01
Aluminum	Total	7429-90-5	6.50E+00 - 6.11E+01	958	942	98.33	6.55	415000	1.22E+04	2.70E+04	2.84E+04	
Antimony	Dissolved	7440-36-0	1.21E-01 - 4.90E+00	74	37	50.00	0.55	10.2	1.89E+00	2.30E+00	1.04E+02	6.00E+00
Antimony	Total	7440-36-0	2.80E-01 - 2.21E+01	957	625	65.31	0.43	108	3.78E+00	8.36E+00	7.11E+01	6.00E+00
Arsenic	Dissolved	7440-38-2	1.50E-01 - 3.00E+00	74	18	24.32	0.64	4.1	7.69E-01	6.69E-01	1.19E+01	1.80E-02
Arsenic	Total	7440-38-2	5.80E-01 - 5.60E+00	958	781	81.52	0.65	147	5.02E+00	8.78E+00	1.24E+01	5.00E+01
Barium	Dissolved	7440-39-3	-	74	74	100.00	2.5	844	2.61E+02	1.66E+02	1.77E+02	
Barium	Total	7440-39-3	5.00E-01 - 5.00E-01	958	957	99.90	0.16	2560	2.06E+02	2.10E+02	2.36E+02	1.00E+03
Beryllium	Dissolved	7440-41-7	1.50E-02 - 5.00E-01	74	9	12.16	0.03	0.51	6.41E-02	7.80E-02	1.15E+01	
Beryllium	Total	7440-41-7	2.00E-02 - 1.30E+00	1307	887	67.87	0.02	25.5	5.34E-01	1.31E+00	2.49E+00	4.00E+00
Boron	Total	7440-42-8	1.30E+01 - 1.30E+01	10	6	60.00	14	180	4.35E+01	6.11E+01		7.50E+02
Cadmium	Dissolved	7440-43-9	1.70E-02 - 5.00E-01	432	138	31.94	0.016	2.1	1.14E-01	2.00E-01	4.74E+00	1.50E+00
Cadmium	Total	7440-43-9	4.00E-02 - 5.30E-01	969	668	68.94	0.056	16.5	5.97E-01	1.15E+00	3.15E+00	5.00E+00
Calcium	Dissolved	7440-70-2	-	74	74	100.00	3000	322000	1.28E+05	6.49E+04	4.53E+04	
Calcium	Total	7440-70-2	2.58E+01 - 2.58E+01	958	957	99.90	38.1	1118000	6.81E+04	6.31E+04	4.59E+04	
Chromium	Dissolved	7440-47-3	1.50E-01 - 1.00E+00	74	35	47.30	0.27	7.6	1.00E+00	1.63E+00	8.03E+00	9.93E+01
Chromium	Total	7440-47-3	1.00E-01 - 1.73E+01	1316	1177	89.44	0.17	348	1.17E+01	2.32E+01	5.64E+01	5.00E+01
Cobalt	Dissolved	7440-48-4	3.50E-02 - 2.30E+00	74	24	32.43	0.21	5.2	7.53E-01	1.06E+00	2.36E+01	
Cobalt	Total	7440-48-4	1.50E-01 - 6.30E+00	958	808	84.34	0.16	112	3.79E+00	8.13E+00	2.11E+01	
Copper	Dissolved	7440-50-8	4.50E-01 - 4.80E+00	74	48	64.86	0.31	9.5	1.96E+00	1.82E+00	1.67E+01	1.21E+01
Copper	Total	7440-50-8	3.50E-01 - 6.70E+00	958	918	95.82	0.36	259	1.93E+01	2.71E+01	2.23E+01	2.00E+02
Iron	Dissolved	7439-89-6	3.40E+00 - 8.55E+01	74	53	71.62	4.5	46000	7.91E+02	5.34E+03	1.31E+04	3.00E+02
Iron	Total	7439-89-6	1.25E+01 - 1.10E+02	958	951	99.27	12.8	398000	1.14E+04	2.46E+04	2.35E+04	1.00E+03
Lead	Dissolved	7439-92-1	1.60E-02 - 1.63E+00	74	11	14.86	0.2	5.62	5.31E-01	8.56E-01	8.32E+00	3.70E+00
Lead	Total	7439-92-1	4.20E-01 - 3.70E+00	952	748	78.57	0.081	262	1.19E+01	2.17E+01	1.82E+01	5.00E+01
Lithium	Dissolved	7439-93-2	2.90E+00 - 4.10E+00	74	68	91.89	5.4	1590	4.18E+01	1.84E+02	5.65E+01	
Lithium	Total	7439-93-2	3.80E+00 - 2.28E+01	958	942	98.33	0.08	1710	2.77E+01	6.59E+01	5.92E+01	
Magnesium	Dissolved	7439-95-4	5.60E+01 - 5.60E+01	74	73	98.65	1130	51900	2.61E+04	1.36E+04	1.03E+04	
Magnesium	Total	7439-95-4	9.90E+01 - 9.90E+01	958	957	99.90	8.33	87900	1.46E+04	1.26E+04	1.09E+04	
Manganese	Dissolved	7439-96-5	4.60E-02 - 2.10E+00	74	64	86.49	0.66	1400	1.73E+02	3.18E+02	3.78E+02	5.00E+01
Manganese	Total	7439-96-5	2.20E-01 - 1.90E+00	958	954	99.58	0.08	4470	3.08E+02	5.11E+02	7.58E+02	2.00E+02
Mercury	Dissolved	7439-97-6	1.40E-02 - 1.00E-01	74	10	13.51	0.014	0.31	5.30E-02	5.70E-02	9.59E-01	1.40E+00
Mercury	Total	7439-97-6	1.30E-02 - 3.10E-01	874	138	15.79	0.035	5.5	8.98E-02	2.75E-01	2.71E-01	1.00E-02
Molybdenum	Dissolved	7439-98-7	4.00E-01 - 4.00E+00	74	56	75.68	0.37	19	1.95E+00	2.44E+00	1.84E+02	
Molybdenum	Total	7439-98-7	2.20E-01 - 3.60E+00	958	868	90.61	0.28	33.1	2.42E+00	2.85E+00	8.11E+01	
Nickel	Dissolved	7440-02-0	1.40E-01 - 3.40E+00	74	45	60.81	0.3	6	1.46E+00	1.09E+00	2.78E+01	7.04E+01
Nickel	Total	7440-02-0	2.50E-01 - 8.60E+00	958	921	96.14	0.43	272	1.13E+01	2.07E+01	3.56E+01	1.00E+02
Potassium	Dissolved	7440-09-7	8.00E+01 - 8.00E+01	74	73	98.65	910	32000	6.95E+03	6.32E+03	3.72E+03	
Potassium	Total	7440-09-7	8.80E+00 - 7.69E+03	958	949	99.06	383	674000	9.40E+03	2.80E+04	5.48E+03	
Selenium	Dissolved	7782-49-2	4.00E-01 - 6.04E+00	74	38	51.35	0.71	8.9	1.97E+00	1.74E+00	6.17E+00	4.60E+00

Table 5.2
Summary Statistics for Surface Water

Analyte	Total or Dissolved	Derived CAS No.	Range of Reported Values for Nondetects	Total Number of Samples	Total Number of Detects	Detection Frequency (%)	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation	Background M2SD	Lowest Standard
Selenium	Total	7782-49-2	5.50E-01 - 4.90E+00	958	410	42.80	0.64	19	1.11E+00	1.13E+00	7.41E+00	2.00E+01
Silicon	Total	7440-21-3	-	49	49	100.00	28.4	36200	8.87E+03	7.64E+03		
Silver	Dissolved	7440-22-4	5.00E-03 - 1.00E+00	432	21	4.86	0.15	32.4	2.09E-01	1.57E+00	8.99E+00	5.90E-01
Silver	Total	7440-22-4	4.00E-02 - 1.40E+00	960	184	19.17	0.084	73.6	2.89E-01	2.40E+00	6.41E+00	1.00E+02
Sodium	Dissolved	7440-23-5	-	74	74	100.00	2000	2020000	2.08E+05	3.25E+05	3.46E+04	
Sodium	Total	7440-23-5	4.91E+01 - 4.91E+01	958	957	99.90	64.61	6460000	1.99E+05	4.38E+05	3.32E+04	
Strontium	Dissolved	7440-24-6	2.40E+00 - 2.40E+00	74	73	98.65	52.1	1830	8.28E+02	4.26E+02	5.47E+02	
Strontium	Total	7440-24-6	5.00E-01 - 5.00E-01	958	957	99.90	0.2	3510	4.34E+02	3.94E+02	5.17E+02	
Thallium	Dissolved	7440-28-0	5.00E-03 - 4.30E+00	72	10	13.89	0.012	4.1	8.79E-01	8.85E-01	3.05E+01	5.00E-01
Thallium	Total	7440-28-0	2.00E-02 - 8.10E+00	958	70	7.31	0.2	5.2	7.27E-01	5.14E-01	2.73E+01	5.00E-01
Tin	Dissolved	7440-31-5	9.80E-02 - 6.90E+00	74	4	5.41	1.8	7.5	9.58E-01	1.19E+00	1.53E+02	
Tin	Total	7440-31-5	4.80E-01 - 5.00E+00	952	105	11.03	0.55	9.2	6.80E-01	6.41E-01	1.43E+02	
Titanium	Total	7440-32-6	2.60E+00 - 2.60E+00	10	5	50.00	2.7	35	6.27E+00	1.05E+01		
Uranium	Dissolved		2.40E+00 - 6.80E+01	55	16	29.09	2.31	15	7.64E+00	1.02E+01		2.44E+03
Uranium	Total		2.00E+00 - 3.60E+01	781	140	17.93	0.596	77	4.11E+00	8.80E+00	1.15E+01	1.00E+01
Vanadium	Dissolved	7440-62-2	9.50E-02 - 7.30E+00	74	25	33.78	0.19	8.2	1.11E+00	1.48E+00	2.34E+02	
Vanadium	Total	7440-62-2	1.20E-01 - 5.44E+00	958	900	93.95	0.13	747	2.55E+01	5.09E+01	4.94E+01	
Zinc	Dissolved	7440-66-6	1.00E+00 - 2.34E+01	74	66	89.19	2	354	5.41E+01	6.12E+01	4.28E+02	1.59E+02
Zinc	Total	7440-66-6	5.00E-01 - 1.20E+02	957	866	90.49	0.72	12200	3.34E+02	8.31E+02	5.44E+02	2.00E+03
PCBs (ug/L)												
PCB-1016	Total	12674-11-2	5.00E-01 - 5.00E-01	9	0	0.00			2.50E-01	0.00E+00		6.40E-05
PCB-1221	Total	11104-28-2	5.00E-01 - 5.00E-01	9	0	0.00			2.50E-01	0.00E+00		6.40E-05
PCB-1232	Total	11141-16-5	5.00E-01 - 5.00E-01	9	0	0.00			2.50E-01	0.00E+00		6.40E-05
PCB-1242	Total	53469-21-9	5.00E-01 - 5.00E-01	9	0	0.00			2.50E-01	0.00E+00		6.40E-05
PCB-1248	Total	12672-29-6	5.00E-01 - 5.00E-01	9	0	0.00			2.50E-01	0.00E+00		6.40E-05
PCB-1254	Total	11097-69-1	5.00E-01 - 5.00E-01	9	2	22.22	0.26	0.7	3.01E-01	1.50E-01		6.40E-05
PCB-1260	Total	11096-82-5	5.00E-01 - 5.00E-01	9	0	0.00			2.50E-01	0.00E+00		6.40E-05
Pesticides (ug/L)												
Diallate (cis or trans)	Total	2303-16-4	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
Hexachlorocyclopentadiene	Total	77-47-4	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		5.00E+00
Isodrin	Total	465-73-6	1.00E-01 - 1.10E-01	3	0	0.00			5.17E-02	2.89E-03		
Radionuclides (pCi/L)												
Americium-241	Dissolved	86954-36-1	1.35E-02 - 1.35E-02	3	2	66.67	0.046	0.163	7.19E-02	8.13E-02	3.66E-01	
Americium-241	Total	86954-36-1	-1.20E-02 - 3.14E-01	2069	876	42.34	0.0032	84	2.66E-01	2.26E+00	2.33E-02	1.50E-01
Gross Alpha	Total	12587-47-2	1.17E-01 - 6.49E+01	32	13	40.63	1.59	521	2.55E+01	9.45E+01	1.83E+01	7.00E+00
Gross Beta	Total	12587-46-1	-3.20E+00 - 4.69E+01	32	24	75.00	0.888	398	2.00E+01	6.97E+01	1.50E+01	8.00E+00
Neptunium-237	Total	13994-20-2	-2.63E-01 - 1.68E-01	19	1	5.26	0.238	0.238	2.43E-03	7.15E-02		3.00E+01
Plutonium-239/240	Dissolved		-2.00E-03 - -2.00E-03	3	2	66.67	0.0345	0.083	3.88E-02	4.22E-02	3.51E+01	
Plutonium-239/240	Total		-1.60E-02 - 2.01E-01	2102	1011	48.10	-0.000048	259	8.31E-01	7.81E+00	1.87E-02	1.50E-01
Tritium	Total	10028-17-8	-3.51E+02 - 2.99E+02	358	20	5.59	-76.7	575	1.08E+01	8.96E+01	4.39E+02	5.00E+02
Uranium Isotopes	Dissolved		-	33	33	100.00	0.47	17.97	4.67E+00	3.48E+00		
Uranium Isotopes	Total		-	1746	1746	100.00	0	56.282	3.08E+00	4.22E+00	7.89E+00	1.00E+01
Uranium-233/234	Dissolved		-	33	33	100.00	0.47	11.8	2.74E+00	2.27E+00	1.36E+01	

Table 5.2
Summary Statistics for Surface Water

Analyte	Total or Dissolved	Derived CAS No.	Range of Reported Values for Nondetects	Total Number of Samples	Total Number of Detects	Detection Frequency (%)	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation	Background M2SD	Lowest Standard
Uranium-233/234	Total		-4.00E-03 - 3.69E-01	1910	1887	98.80	0.02	26.7	1.51E+00	1.83E+00	1.97E+00	1.00E+01
Uranium-235	Dissolved	15117-96-1	-1.12E-01 - 1.70E-01	33	15	45.45	0.025	0.716	1.51E-01	1.83E-01	1.96E+00	
Uranium-235	Total	15117-96-1	-9.60E-02 - 2.85E-01	1910	1092	57.17	0.0063	0.982	5.55E-02	7.76E-02	1.78E-01	1.00E+01
Uranium-238	Dissolved	7440-61-1	1.44E-03 - 1.44E-03	33	32	96.97	0.446	5.82	1.80E+00	1.15E+00	9.22E+00	
Uranium-238	Total	7440-61-1	-8.67E-03 - 5.26E-01	1910	1892	99.06	0.026	30.8	1.48E+00	2.48E+00	1.84E+00	1.00E+01
SVOCs (ug/L)												
1,2,4,5-Tetrachlorobenzene	Total	95-94-3	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		9.70E-01
1,2,4-Trichlorobenzene	Total	120-82-1	2.00E-01 - 1.10E+01	136	0	0.00			1.38E+00	1.43E+00		3.50E+01
1,3,5-Trinitrobenzene	Total	99-35-4	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
1,3-Dinitrobenzene	Total	99-65-0	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
1,4-Naphthoquinone	Total	130-15-4	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
1,4-Phenylenediamine	Total	106-50-3	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
1-Naphthylamine	Total	134-32-7	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
2,3,4,6-Tetrachlorophenol	Total	58-90-2	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
2,4,5-Trichlorophenol	Total	95-95-4	9.80E+00 - 8.40E+01	30	0	0.00			6.99E+00	6.90E+00		7.00E+02
2,4,6-Trichlorophenol	Total	88-06-2	9.80E+00 - 3.30E+01	30	0	0.00			5.61E+00	2.06E+00		1.40E+00
2,4-Dichlorophenol	Total	120-83-2	9.80E+00 - 3.30E+01	30	0	0.00			5.61E+00	2.06E+00		2.10E+01
2,4-Dimethylphenol	Total	105-67-9	9.80E+00 - 3.30E+01	30	0	0.00			5.61E+00	2.06E+00		1.40E+02
2,4-Dinitrophenol	Total	51-28-5	2.60E+01 - 8.40E+01	30	0	0.00			2.59E+01	4.61E+00		1.40E+01
2,4-Dinitrotoluene	Total	121-14-2	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		1.10E-01
2,6-Dichlorophenol	Total	87-65-0	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
2,6-Dinitrotoluene	Total	606-20-2	9.80E+00 - 1.12E+01	30	0	0.00			5.24E+00	1.75E-01		2.30E+02
2-Acetylaminofluorene	Total	53-96-3	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
2-Chloronaphthalene	Total	91-58-7	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		5.60E+02
2-Chlorophenol	Total	95-57-8	9.80E+00 - 3.30E+01	30	0	0.00			5.61E+00	2.06E+00		3.50E+01
2-Methylnaphthalene	Total	91-57-6	9.80E+00 - 3.30E+01	33	1	3.03	6.2	6.2	5.61E+00	1.97E+00		
2-Methylphenol	Total	95-48-7	9.80E+00 - 1.12E+01	27	0	0.00			5.25E+00	1.82E-01		1.83E+03
2-Naphthylamine	Total	91-59-8	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
2-Nitroaniline	Total	88-74-4	2.60E+01 - 8.40E+01	33	0	0.00			2.59E+01	4.39E+00		
2-Nitrophenol	Total	88-75-5	9.80E+00 - 3.30E+01	30	0	0.00			5.61E+00	2.06E+00		
3,3'-Dichlorobenzidine	Total	91-94-1	1.00E+01 - 3.30E+01	33	0	0.00			1.03E+01	1.76E+00		2.10E-02
3,3'-Dimethylbenzidine	Total	119-93-7	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
3-Methylcholanthrene	Total	56-49-5	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
3-Nitroaniline	Total	99-09-2	2.60E+01 - 8.40E+01	33	0	0.00			2.59E+01	4.39E+00		
4,6-Dinitro-2-methylphenol	Total	534-52-1	2.60E+01 - 8.40E+01	30	0	0.00			2.59E+01	4.61E+00		2.70E-01
4-Aminobiphenyl	Total	92-67-1	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
4-Bromophenyl-phenylether	Total	101-55-3	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		
4-Chloro-3-methylphenol	Total	59-50-7	1.00E+01 - 3.30E+01	30	0	0.00			1.02E+01	2.09E+00		3.00E+01
4-Chloroaniline	Total	106-47-8	1.00E+01 - 3.30E+01	33	0	0.00			1.02E+01	1.99E+00		
4-Chlorophenyl-phenyl Ether	Total	7005-72-3	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		
4-Methylphenol	Total	106-44-5	1.00E+01 - 1.00E+01	1	0	0.00			5.00E+00			
4-Nitroaniline	Total	100-01-6	2.60E+01 - 8.40E+01	33	2	6.06	1.1	5.3	2.45E+01	7.06E+00		
5-Nitro-o-toluidine	Total	99-55-8	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		

Table 5.2
Summary Statistics for Surface Water

Analyte	Total or Dissolved	Derived CAS No.	Range of Reported Values for Nondetects	Total Number of Samples	Total Number of Detects	Detection Frequency (%)	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation	Background M2SD	Lowest Standard
7,12-Dimethylbenz(a)anthracene	Total	57-97-6	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
a,a-Dimethylphenethylamine	Total	122-09-8	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
Acenaphthene	Total	83-32-9	9.80E+00 - 3.30E+01	33	1	3.03	2.7	2.7	5.50E+00	2.03E+00		4.20E+02
Acenaphthylene	Total	208-96-8	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		2.80E-03
Acetophenone	Total	98-86-2	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
Aniline	Total	62-53-3	1.00E+01 - 1.00E+01	1	0	0.00			5.00E+00			6.10E+00
Anthracene	Total	120-12-7	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		2.10E+03
Aramite	Total	140-57-8	2.00E+01 - 6.70E+01	3	0	0.00			1.80E+01	1.34E+01		1.40E+00
Benzo(a)anthracene	Total	56-55-3	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		3.80E-03
Benzo(a)pyrene	Total	50-32-8	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		3.80E-03
Benzo(b)fluoranthene	Total	205-99-2	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		3.80E-03
Benzo(g,h,i)perylene	Total	191-24-2	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		3.80E-03
Benzo(k)fluoranthene	Total	207-08-9	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		3.80E-03
Benzoic Acid	Total	65-85-0	4.90E+01 - 5.62E+01	27	1	3.70	17.5	17.5	2.60E+01	1.92E+00		
Benzyl Alcohol	Total	100-51-6	1.00E+01 - 3.30E+01	33	0	0.00			1.02E+01	1.99E+00		
bis(2-Chloroethoxy) Methane	Total	111-91-1	9.80E+00 - 1.12E+01	30	0	0.00			5.24E+00	1.75E-01		
bis(2-Chloroethyl) Ether	Total	111-44-4	9.80E+00 - 1.12E+01	30	0	0.00			5.24E+00	1.75E-01		3.00E-02
bis(2-Chloroisopropyl) Ether	Total	108-60-1	9.80E+00 - 1.12E+01	30	0	0.00			5.24E+00	1.75E-01		2.80E+02
bis(2-ethylhexyl)phthalate	Total	117-81-7	9.80E+00 - 1.12E+01	30	0	0.00			5.24E+00	1.75E-01		1.20E+00
Butylbenzylphthalate	Total	85-68-7	9.80E+00 - 3.30E+01	33	1	3.03	1.6	1.6	5.47E+00	2.09E+00		1.40E+03
Chlorobenzilate	Total	510-15-6	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
Chrysene	Total	218-01-9	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		3.80E-03
Dibenz(a,h)anthracene	Total	53-70-3	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		3.80E-03
Dibenzofuran	Total	132-64-9	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		
Diethylphthalate	Total	84-66-2	9.80E+00 - 1.12E+01	33	1	3.03	2	2	5.13E+00	5.89E-01		5.60E+03
Dimethoate	Total	60-51-5	5.10E-01 - 5.10E-01	3	2	66.67	0.62	67	2.26E+01	3.84E+01		
Dimethylaminoazobenzene	Total	60-11-7	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
Dimethylphthalate	Total	131-11-3	9.80E+00 - 3.30E+01	33	3	9.09	0.79	3.6	5.25E+00	2.30E+00		7.00E+04
Di-n-butylphthalate	Total	84-74-2	9.80E+00 - 1.12E+01	33	4	12.12	1	6	4.93E+00	1.13E+00		7.00E+02
Di-n-octylphthalate	Total	117-84-0	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		
Diphenylamine	Total	122-39-4	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
Disulfoton	Total	298-04-4	5.10E-01 - 5.20E-01	3	0	0.00			2.58E-01	2.89E-03		
Ethyl Methanesulfonate	Total	62-50-0	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
Famphur	Total	52-85-7	1.30E+00 - 1.30E+00	3	0	0.00			6.50E-01	8.60E-09		
Fluoranthene	Total	206-44-0	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		1.30E+02
Fluorene	Total	86-73-7	9.80E+00 - 3.30E+01	33	1	3.03	2.6	2.6	5.50E+00	2.04E+00		2.80E+02
Hexachlorobenzene	Total	118-74-1	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		2.80E-04
Hexachlorobutadiene	Total	87-68-3	2.00E-01 - 1.10E+01	136	0	0.00			1.38E+00	1.43E+00		4.40E-01
Hexachlorophene	Total	70-30-4	1.00E+02 - 3.30E+02	3	0	0.00			8.83E+01	6.64E+01		
Hexachloropropene	Total	1888-71-7	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
Indeno(1,2,3-cd)pyrene	Total	193-39-5	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		3.80E-03
Isophorone	Total	78-59-1	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		3.60E+01
Isosafrole	Total	120-58-1	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		

Table 5.2
Summary Statistics for Surface Water

Analyte	Total or Dissolved	Derived CAS No.	Range of Reported Values for Nondetects	Total Number of Samples	Total Number of Detects	Detection Frequency (%)	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation	Background M2SD	Lowest Standard
Kepone	Total	143-50-0	5.00E-01 - 5.50E-01	3	0	0.00			2.58E-01	1.44E-02		
Methapyrilene	Total	91-80-5	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
Methyl Methanesulfonate	Total	66-27-3	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
Methyl Parathion	Total	298-00-0	5.10E-01 - 5.20E-01	3	0	0.00			2.58E-01	2.89E-03		
Naphthalene	Total	91-20-3	3.00E-01 - 1.10E+01	136	2	1.47	1.1	12	1.42E+00	1.67E+00		2.80E+01
Nitrobenzene	Total	98-95-3	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		3.50E+00
Nitroquinoline-1-Oxide	Total	56-57-5	2.00E+01 - 6.70E+01	3	0	0.00			1.80E+01	1.34E+01		
N-Nitrosodiethylamine	Total	55-18-5	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		2.30E-04
N-Nitrosodimethylamine	Total	62-75-9	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		6.90E-04
N-Nitrosodi-n-butylamine	Total	924-16-3	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		4.30E-03
N-Nitroso-di-n-propylamine	Total	621-64-7	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		5.00E-03
n-Nitrosodiphenylamine	Total	86-30-6	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		3.30E+00
N-Nitrosomethylethylamine	Total	10595-95-6	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		1.60E-03
N-Nitrosomorpholine	Total	59-89-2	1.00E+01 - 3.30E+01	3	1	33.33	1	1	7.50E+00	8.05E+00		
N-Nitrosopiperidine	Total	100-75-4	5.10E+01 - 1.70E+02	3	0	0.00			4.55E+01	3.42E+01		
N-Nitrosopyrrolidine	Total	930-55-2	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		1.60E-02
O,O,O-Triethyl phosphorothioate	Total	126-68-1	5.10E-01 - 5.20E-01	3	0	0.00			2.58E-01	2.89E-03		
o-Toluidine	Total	95-53-4	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
Parathion	Total	56-38-2	5.10E-01 - 5.20E-01	3	0	0.00			2.58E-01	2.89E-03		1.30E-02
Pentachlorobenzene	Total	608-93-5	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		1.40E+00
Pentachloronitrobenzene	Total	82-68-8	5.10E+01 - 5.10E+01	1	0	0.00			2.55E+01			
Pentachlorophenol	Total	87-86-5	2.60E+01 - 8.40E+01	30	0	0.00			2.59E+01	4.61E+00		2.70E-01
Phenacetin	Total	62-44-2	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
Phenanthrene	Total	85-01-8	9.80E+00 - 3.30E+01	33	1	3.03	3.5	3.5	5.52E+00	2.00E+00		2.80E-03
Phenol	Total	108-95-2	9.80E+00 - 3.30E+01	30	1	3.33	3.5	3.5	5.56E+00	2.10E+00		2.10E+03
Phorate	Total	298-02-2	5.10E-01 - 5.20E-01	3	0	0.00			2.58E-01	2.89E-03		
Pronamide	Total	23950-58-5	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
Pyrene	Total	129-00-0	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		2.10E+02
Safrole	Total	94-59-7	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
Tetraethyl Dithiopyrophosphate	Total	3689-24-5	5.10E-01 - 5.20E-01	3	0	0.00			2.58E-01	2.89E-03		
Thionazine	Total	297-97-2	5.10E-01 - 5.20E-01	3	0	0.00			2.58E-01	2.89E-03		
Tributyl Phosphate	Total	126-73-8	9.80E+01 - 1.12E+02	29	0	0.00			5.25E+01	1.72E+00		
VOCs (ug/L)												
1,1,1,2-Tetrachloroethane	Total	630-20-6	2.00E-01 - 5.00E+00	123	0	0.00			1.02E+00	8.85E-01		
1,1,1-Trichloroethane	Total	71-55-6	2.00E-01 - 1.00E+01	181	11	6.08	0.3	4	9.61E-01	9.31E-01		2.00E+02
1,1,2,2-Tetrachloroethane	Total	79-34-5	3.00E-01 - 1.00E+01	181	1	0.55	0.1	0.1	9.20E-01	8.97E-01		1.70E-01
1,1,2-Trichloro-1,2,2-trifluoroethane	Total	76-13-1	2.00E-01 - 5.00E+00	117	3	2.56	7	19.8	2.00E+00	2.39E+00		
1,1,2-Trichloroethane	Total	79-00-5	2.00E-01 - 1.00E+01	181	0	0.00			9.22E-01	8.96E-01		2.70E+00
1,1-Dichloroethane	Total	75-34-3	2.00E-01 - 1.00E+01	181	7	3.87	0.18	1.7	9.30E-01	9.00E-01		3.65E+03
1,1-Dichloroethene	Total	75-35-4	2.00E-01 - 1.00E+01	181	6	3.31	0.2	5	9.61E-01	9.57E-01		7.00E+00
1,1-Dichloropropene	Total	563-58-6	2.00E-01 - 5.00E+00	125	0	0.00			1.04E+00	8.97E-01		
1,2,3-Trichlorobenzene	Total	87-61-6	2.00E-01 - 5.00E+00	125	0	0.00			1.04E+00	8.97E-01		
1,2,3-Trichloropropane	Total	96-18-4	2.00E-01 - 5.00E+00	125	0	0.00			1.04E+00	8.98E-01		

Table 5.2
Summary Statistics for Surface Water

Analyte	Total or Dissolved	Derived CAS No.	Range of Reported Values for Nondetects	Total Number of Samples	Total Number of Detects	Detection Frequency (%)	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation	Background M2SD	Lowest Standard
1,2,4-Trimethylbenzene	Total	95-63-6	2.00E-01 - 5.00E+00	125	0	0.00			1.04E+00	8.98E-01		
1,2-Dibromoethane	Total	106-93-4	2.00E-01 - 5.00E+00	125	0	0.00			1.04E+00	8.98E-01		4.10E-04
1,2-Dichlorobenzene	Total	95-50-1	2.00E-01 - 1.10E+01	190	0	0.00			1.13E+00	1.28E+00		4.20E+02
1,2-Dichloroethane	Total	107-06-2	2.00E-01 - 1.00E+01	168	0	0.00			9.55E-01	9.22E-01		3.80E-01
1,2-Dichloroethene	Total	540-59-0	1.00E+01 - 1.00E+01	2	0	0.00			5.00E+00	0.00E+00		7.00E+01
1,2-Dichloropropane	Total	78-87-5	2.00E-01 - 1.00E+01	181	0	0.00			9.21E-01	8.96E-01		5.00E-01
1,3,5-Trimethylbenzene	Total	108-67-8	2.00E-01 - 5.00E+00	125	0	0.00			1.04E+00	8.99E-01		
1,3-Dichlorobenzene	Total	541-73-1	2.00E-01 - 1.10E+01	190	3	1.58	0.44	0.82	1.11E+00	1.24E+00		9.40E+01
1,3-Dichloropropane	Total	142-28-9	2.00E-01 - 5.00E+00	123	0	0.00			1.01E+00	8.86E-01		
1,4-Dichlorobenzene	Total	106-46-7	2.00E-01 - 1.10E+01	190	1	0.53	0.2	0.2	1.13E+00	1.28E+00		6.30E+01
2,2-Dichloropropane	Total	594-20-7	2.00E-01 - 5.00E+00	125	0	0.00			1.18E+00	9.59E-01		
2-Butanone	Total	78-93-3	5.00E+00 - 1.00E+02	116	2	1.72	15	16	5.37E+00	6.20E+00		2.19E+04
2-Chloroethyl Vinyl Ether	Total	110-75-8	0.00E+00 - 5.00E+00	37	1	2.70	0	0	1.41E+00	1.09E+00		
2-Chlorotoluene	Total	95-49-8	2.00E-01 - 5.00E+00	125	0	0.00			1.04E+00	8.97E-01		
2-Hexanone	Total	591-78-6	1.00E+00 - 5.00E+01	122	1	0.82	4	4	4.72E+00	2.85E+00		
2-Picoline	Total	109-06-8	1.00E+01 - 3.30E+01	3	0	0.00			8.83E+00	6.64E+00		
4-Chlorotoluene	Total	106-43-4	2.00E-01 - 5.00E+00	125	0	0.00			1.04E+00	8.98E-01		
4-Isopropyltoluene	Total	99-87-6	2.00E-01 - 5.00E+00	125	0	0.00			1.04E+00	8.97E-01		
4-Methyl-2-pentanone	Total	108-10-1	1.00E+00 - 5.00E+01	122	0	0.00			4.74E+00	2.84E+00		2.92E+03
Acetone	Total	67-64-1	2.00E+00 - 2.22E+01	117	29	24.79	2	63.1	6.27E+00	8.18E+00		3.65E+03
Benzene	Total	71-43-2	2.00E-01 - 1.00E+01	181	4	2.21	0.1	4.7	9.32E-01	9.34E-01		2.20E+00
Bromobenzene	Total	108-86-1	2.00E-01 - 5.00E+00	125	0	0.00			1.04E+00	8.97E-01		
Bromochloromethane	Total	74-97-5	2.00E-01 - 5.00E+00	125	0	0.00			1.04E+00	8.97E-01		
Bromodichloromethane	Total	75-27-4	5.00E-01 - 1.00E+01	181	1	0.55	0.29	0.29	9.22E-01	8.96E-01		5.50E-01
Bromoform	Total	75-25-2	2.00E-01 - 1.00E+01	181	1	0.55	1.9	1.9	9.30E-01	8.98E-01		4.30E+00
Bromomethane	Total	74-83-9	2.00E-01 - 1.00E+01	181	0	0.00			1.06E+00	1.18E+00		9.80E+00
Carbon Disulfide	Total	75-15-0	2.00E-01 - 1.00E+01	122	1	0.82	0.1	0.1	1.67E+00	1.08E+00		3.65E+03
Carbon Tetrachloride	Total	56-23-5	2.00E-01 - 1.00E+01	181	27	14.92	0.59	310	6.47E+00	3.50E+01		2.30E-01
Chlorobenzene	Total	108-90-7	2.00E-01 - 1.00E+01	181	0	0.00			9.22E-01	8.96E-01		1.00E+02
Chloroethane	Total	75-00-3	2.00E-01 - 1.00E+01	181	0	0.00			1.06E+00	1.19E+00		2.94E+01
Chloroform	Total	67-66-3	5.00E-01 - 1.00E+01	181	56	30.94	0.1	120	2.82E+00	1.35E+01		3.40E+00
Chloromethane	Total	74-87-3	5.00E-01 - 1.00E+01	181	1	0.55	0.74	0.74	1.06E+00	1.18E+00		5.60E+00
cis-1,2-Dichloroethene	Total	156-59-2	2.00E-01 - 5.00E+00	125	19	15.20	0.15	210	4.15E+00	2.37E+01		7.00E+01
cis-1,3-Dichloropropene	Total	10061-01-5	2.00E-01 - 1.00E+01	181	0	0.00			9.21E-01	8.96E-01		3.40E-01
Dibromochloromethane	Total	124-48-1	2.00E-01 - 1.00E+01	181	0	0.00			9.22E-01	8.96E-01		5.40E+01
Dibromomethane	Total	74-95-3	2.00E-01 - 5.00E+00	125	0	0.00			1.04E+00	8.98E-01		
Dichlorodifluoromethane	Total	75-71-8	5.00E-01 - 1.00E+01	179	1	0.56	0.28	0.28	1.02E+00	1.11E+00		
Ethylbenzene	Total	100-41-4	2.00E-01 - 1.00E+01	181	1	0.55	0.43	0.43	9.21E-01	8.96E-01		5.30E+02
Hexachloroethane	Total	67-72-1	9.80E+00 - 3.30E+01	33	0	0.00			5.57E+00	1.97E+00		4.00E-01
Isopropylbenzene	Total	98-82-8	2.00E-01 - 5.00E+00	125	0	0.00			1.04E+00	8.97E-01		
m,p-Xylene	Total		2.00E+00 - 5.00E+00	9	0	0.00			1.33E+00	6.61E-01		1.40E+03
Methylene Chloride	Total	75-09-2	5.00E-01 - 1.60E+01	181	45	24.86	0.1	15	1.35E+00	2.12E+00		4.60E+00
n-Butylbenzene	Total	104-51-8	2.00E-01 - 5.00E+00	125	0	0.00			1.04E+00	8.98E-01		

Table 5.2
Summary Statistics for Surface Water

Analyte	Total or Dissolved	Derived CAS No.	Range of Reported Values for Nondetects	Total Number of Samples	Total Number of Detects	Detection Frequency (%)	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation	Background M2SD	Lowest Standard
n-Propylbenzene	Total	103-65-1	2.00E-01 - 5.00E+00	125	0	0.00			1.04E+00	8.98E-01		
o-Xylene	Total	95-47-6	1.00E+00 - 5.00E+00	9	0	0.00			9.44E-01	8.82E-01		1.40E+03
sec-Butylbenzene	Total	135-98-8	2.00E-01 - 5.00E+00	125	0	0.00			1.04E+00	8.98E-01		
Styrene	Total	100-42-5	2.00E-01 - 1.00E+01	127	0	0.00			1.10E+00	1.02E+00		1.00E+02
tert-Butylbenzene	Total	98-06-6	2.00E-01 - 5.00E+00	125	0	0.00			1.04E+00	8.98E-01		
Tetrachloroethene	Total	127-18-4	1.00E+00 - 1.00E+01	178	26	14.61	0.2	44	1.62E+00	4.26E+00		6.90E-01
Toluene	Total	108-88-3	2.00E-01 - 1.00E+01	181	22	12.15	0.1	10	9.86E-01	1.19E+00		1.00E+03
trans-1,2-Dichloroethene	Total	156-60-5	2.00E-01 - 5.00E+00	179	1	0.56	0.7	0.7	8.35E-01	8.15E-01		1.00E+02
trans-1,3-Dichloropropene	Total	10061-02-6	2.00E-01 - 1.00E+01	181	0	0.00			9.22E-01	8.96E-01		3.40E-01
Trichloroethene	Total	79-01-6	2.00E-01 - 1.00E+01	181	21	11.60	0.2	66	1.70E+00	5.95E+00		2.50E+00
Trichlorofluoromethane	Total	75-69-4	2.00E-01 - 5.00E+00	179	0	0.00			9.02E-01	7.85E-01		
Vinyl Chloride	Total	75-01-4	3.00E-01 - 1.00E+01	181	5	2.76	0.8	9.7	1.13E+00	1.38E+00		2.30E-02
Total Xylenes	Total	1330-20-7	5.00E-01 - 1.00E+01	127	0	0.00			1.43E+00	9.18E-01		1.40E+03
Water Quality Parameters (ug/L)												
Ammonia (as N)	Total	ConID 170	1.00E+02 - 1.00E+02	285	204	71.58	26	4400	4.27E+02	7.83E+02		5.00E+02
Chloride	Total	16887-00-6	-	110	110	100.00	1100	340000	7.49E+04	7.70E+04	4.49E+04	2.50E+05
Cyanide	Total	57-12-5	-	2	2	100.00	4.59	36.5	2.05E+01	2.26E+01	9.35E+02	5.00E+00
Fluoride	Total	ConID 209	3.30E+02 - 6.60E+02	110	106	96.36	60	9600	4.21E+02	8.97E+02	5.86E+02	2.00E+03
Nitrate/Nitrite (as N)	Total	ConID 184	5.00E+01 - 5.00E+01	636	603	94.81	11	1200000	9.26E+03	5.61E+04	3.48E+03	1.00E+04
Silica	Total	7631-86-9	-	10	10	100.00	730	21000	1.23E+04	7.35E+03	1.45E+06	
Sulfate	Total	14808-79-8	5.00E+03 - 5.00E+03	110	109	99.09	3000	350000	2.49E+04	3.42E+04	4.27E+04	2.50E+05
Total Petroleum Hydrocarbons	Total		1.00E+03 - 1.00E+03	3	0	0.00			5.00E+02	0.00E+00		

Note: The PCBs identified above under the Analyte column are equivalent to Aroclors, for example PCB-1254 is the same as Aroclor-1254.

Table 5.3
Summary Statistics for Sediment

Analyte	Total or Dissolved	Derived CAS No.	Range of Reported Values for Nondetects	Total Number of Samples	Total Number of Detects	Detection Frequency (%)	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation	Background M2SD	WRW PRG
Dioxins and Furans (ug/kg)												
1234678-HpCDF	Total	67562-39-4	4.19E-03 - 4.19E-03	6	5	83.33	0.000807	0.0298	6.60E-03	1.14E-02		
1234789-HpCDF	Total	55673-89-7	2.26E-03 - 2.86E-03	6	3	50.00	0.00074	0.00243	1.31E-03	6.20E-04		
123478-HxCDD	Total	39227-28-6	2.26E-03 - 4.74E-03	6	1	16.67	0.00126	0.00126	1.61E-03	5.03E-04		4.83E-01
123478-HxCDF	Total	70648-26-9	2.71E-03 - 4.19E-03	6	4	66.67	0.00055	0.00371	1.59E-03	1.19E-03		
123678-HxCDD	Total	57653-85-7	2.26E-03 - 4.74E-03	6	2	33.33	0.00122	0.00455	2.12E-03	1.29E-03		4.83E-01
123678-HxCDF	Total	57117-44-9	2.71E-03 - 4.74E-03	6	2	33.33	0.000562	0.0025	1.72E-03	7.39E-04		
123789-HxCDD	Total	19408-74-3	2.26E-03 - 4.74E-03	6	2	33.33	0.00106	0.00329	1.88E-03	8.70E-04		4.83E-01
123789-HxCDF	Total	72918-21-9	1.84E-03 - 4.74E-03	6	1	16.67	0.000553	0.000553	1.29E-03	6.16E-04		
12378-PeCDF	Total	57117-41-6	2.26E-03 - 4.74E-03	6	1	16.67	0.00197	0.00197	1.73E-03	4.88E-04		
234678-HxCDF	Total	60851-34-5	2.71E-03 - 4.74E-03	6	2	33.33	0.000781	0.00199	1.67E-03	5.87E-04		
23478-PeCDF	Total	57117-31-4	2.71E-03 - 4.74E-03	6	2	33.33	0.00143	0.00429	2.16E-03	1.12E-03		
2378-TCDD	Total	1746-01-6	9.04E-04 - 1.90E-03	6	1	16.67	0.00278	0.00278	1.02E-03	8.82E-04		2.48E-02
2378-TCDF	Total	51207-31-9	9.04E-04 - 1.90E-03	6	1	16.67	0.00612	0.00612	1.58E-03	2.23E-03		
Heptachlorodibenzo-p-dioxin	Total	35822-46-9	4.19E-03 - 4.19E-03	6	5	83.33	0.00285	0.0946	2.41E-02	3.55E-02		
OCDD	Total	3268-87-9	-	6	6	100.00	0.0133	0.539	1.46E-01	2.02E-01		
OCDF	Total	39001-02-0	8.38E-03 - 8.38E-03	6	5	83.33	0.00128	0.0409	1.05E-02	1.52E-02		
Pentachlorodibenzo-p-dioxin	Total	40321-76-4	1.84E-03 - 4.74E-03	6	1	16.67	0.000372	0.000372	1.42E-03	7.36E-04		
Herbicides (ug/kg)												
2,4,5-T	Total	93-76-5	6.00E+01 - 6.00E+01	1	0	0.00			3.00E+01			8.01E+05
2,4,5-TP (Silvex)	Total	93-72-1	6.00E+01 - 6.00E+01	1	0	0.00			3.00E+01			1.69E+05
2,4-D	Total	94-75-7	1.80E+02 - 1.80E+02	1	0	0.00			9.00E+01			8.01E+05
2,4-DB	Total	94-82-6	1.40E+03 - 1.40E+03	1	0	0.00			7.00E+02			6.41E+05
4-Nitrophenol	Total	100-02-7	8.60E+02 - 1.80E+04	289	1	0.35	1300	1300	1.63E+03	1.27E+03		6.41E+05
Ametryne	Total	834-12-8	5.00E+01 - 5.00E+01	4	0	0.00			2.50E+01	0.00E+00		
Dalapon	Total	75-99-0	2.30E+03 - 2.30E+03	1	0	0.00			1.15E+03			2.40E+06
Dicamba	Total	1918-00-9	9.60E+01 - 9.60E+01	1	0	0.00			4.80E+01			2.40E+06
Dichloroprop	Total	120-36-5	6.50E+02 - 6.50E+02	1	0	0.00			3.25E+02			
Dinoseb	Total	88-85-7	8.40E+01 - 8.40E+01	1	0	0.00			4.20E+01			8.01E+04
MCPA	Total	94-74-6	9.40E+04 - 9.40E+04	1	0	0.00			4.70E+04			4.01E+04
MCPP	Total	93-65-2	1.40E+05 - 1.40E+05	1	0	0.00			7.00E+04			8.01E+04
Metals (ug/kg)												
Aluminum	Total	7429-90-5	-	386	386	100.00	763000	49000000	1.11E+07	7.13E+06	1.80E+07	2.48E+07
Antimony	Total	7440-36-0	1.90E+02 - 3.91E+04	355	52	14.65	210	51300	4.28E+03	6.85E+03	1.01E+04	4.44E+04
Arsenic	Total	7440-38-2	4.63E+02 - 4.80E+03	385	374	97.14	480	27900	4.83E+03	2.82E+03	6.26E+03	2.41E+03
Barium	Total	7440-39-3	3.21E+04 - 3.21E+04	386	385	99.74	7200	404000	1.24E+05	7.18E+04	1.97E+05	2.87E+06
Beryllium	Total	7440-41-7	9.00E+01 - 1.90E+03	380	273	71.84	110	6700	6.92E+02	5.27E+02	1.47E+03	1.00E+05
Boron	Total	7440-42-8	1.10E+03 - 1.20E+03	106	103	97.17	1200	30000	7.47E+03	4.71E+03		9.48E+06
Cadmium	Total	7440-43-9	2.70E+01 - 4.00E+03	377	155	41.11	36	44000	7.87E+02	2.37E+03	1.21E+03	9.14E+04
Calcium	Total	7440-70-2	-	386	386	100.00	470000	140000000	1.15E+07	1.48E+07	7.38E+06	
Cesium	Total	7440-46-2	5.20E+02 - 7.49E+05	234	47	20.09	680	13600	2.50E+04	4.16E+04	2.26E+05	
Chromium	Total	7440-47-3	1.20E+03 - 2.00E+04	386	372	96.37	1300	140000	1.39E+04	1.07E+04	2.45E+04	2.84E+04
Chromium (VI)	Total	18540-29-9	5.00E+00 - 5.00E+00	42	14	33.33	5	13	4.29E+00	3.00E+00		2.84E+04
Cobalt	Total	7440-48-4	9.50E+02 - 1.06E+04	384	360	93.75	1300	20100	6.88E+03	3.33E+03	1.26E+04	1.22E+05

Table 5.3
Summary Statistics for Sediment

Analyte	Total or Dissolved	Derived CAS No.	Range of Reported Values for Nondetects	Total Number of Samples	Total Number of Detects	Detection Frequency (%)	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation	Background M2SD	WRW PRG
Copper	Total	7440-50-8	7.45E+02 - 1.82E+04	386	370	95.85	2200	324000	1.92E+04	2.32E+04	2.76E+04	4.44E+06
Iron	Total	7439-89-6	-	386	386	100.00	1680000	55000000	1.47E+07	6.81E+06	2.32E+07	3.33E+07
Lead	Total	7439-92-1	-	386	386	100.00	2000	234000	2.49E+04	2.15E+04	3.81E+04	1.00E+06
Lithium	Total	7439-93-2	1.40E+03 - 2.84E+04	379	321	84.70	1600	37000	8.41E+03	5.54E+03	2.05E+04	2.22E+06
Magnesium	Total	7439-95-4	-	386	386	100.00	263000	22900000	2.84E+06	1.74E+06	4.07E+06	
Manganese	Total	7439-96-5	-	386	386	100.00	35800	2500000	2.85E+05	2.41E+05	6.69E+05	4.19E+05
Mercury	Total	7439-97-6	5.00E+00 - 6.20E+02	353	129	36.54	13	3800	1.01E+02	2.81E+02	2.00E+02	3.29E+04
Molybdenum	Total	7439-98-7	1.40E+02 - 1.30E+04	378	139	36.77	190	11700	1.68E+03	1.57E+03	1.68E+04	5.55E+05
Nickel	Total	7440-02-0	2.20E+03 - 2.64E+04	385	354	91.95	1400	216000	1.38E+04	1.24E+04	1.76E+04	2.22E+06
Potassium	Total	7440-09-7	1.63E+05 - 4.18E+06	384	366	95.31	276000	6500000	1.70E+06	9.52E+05	2.52E+06	
Selenium	Total	7782-49-2	1.40E+02 - 4.60E+03	375	91	24.27	260	3800	5.63E+02	5.21E+02	1.73E+03	5.55E+05
Silicon	Total	7440-21-3	-	119	119	100.00	64900	1960000	4.85E+05	3.80E+05		
Silver	Total	7440-22-4	1.00E+01 - 6.30E+03	371	64	17.25	90	3100000	9.72E+03	1.61E+05	2.04E+03	5.55E+05
Sodium	Total	7440-23-5	4.11E+04 - 6.37E+05	384	335	87.24	23300	2240000	3.37E+05	3.41E+05	4.45E+05	
Strontium	Total	7440-24-6	1.36E+04 - 1.36E+04	383	382	99.74	4100	526000	5.38E+04	4.67E+04	1.51E+05	6.67E+07
Thallium	Total	7440-28-0	2.40E+02 - 3.50E+03	376	60	15.96	200	10000	4.38E+02	6.93E+02	8.21E+02	7.78E+03
Tin	Total	7440-31-5	6.60E+02 - 1.27E+05	377	65	17.24	920	77200	6.52E+03	8.82E+03	7.09E+04	6.67E+07
Titanium	Total	7440-32-6	-	106	106	100.00	36000	330000	1.31E+05	6.12E+04		1.70E+08
Uranium	Total	11-09-6	9.60E+02 - 3.90E+04	135	8	5.93	1100	20000	3.63E+03	3.50E+03		3.33E+05
Vanadium	Total	7440-62-2	2.20E+03 - 3.36E+04	386	378	97.93	2300	96000	2.90E+04	1.42E+04	5.13E+04	1.11E+05
Zinc	Total	7440-66-6	3.55E+04 - 3.55E+04	386	385	99.74	10600	2080000	1.35E+05	1.77E+05	3.30E+05	3.33E+07
PCBs (ug/kg)												
PCB-1016	Total	12674-11-2	3.50E+01 - 9.90E+02	313	0	0.00			6.54E+01	5.98E+01		1.35E+03
PCB-1221	Total	11104-28-2	3.50E+01 - 9.90E+02	313	0	0.00			7.07E+01	6.09E+01		1.35E+03
PCB-1232	Total	11141-16-5	3.50E+01 - 9.90E+02	313	0	0.00			6.53E+01	5.98E+01		1.35E+03
PCB-1242	Total	53469-21-9	3.50E+01 - 9.90E+02	313	0	0.00			6.53E+01	5.98E+01		1.35E+03
PCB-1248	Total	12672-29-6	3.50E+01 - 9.90E+02	313	0	0.00			6.53E+01	5.98E+01		1.35E+03
PCB-1254	Total	11097-69-1	3.50E+01 - 2.00E+03	317	72	22.71	7.3	5200	1.72E+02	3.76E+02		1.35E+03
PCB-1260	Total	11096-82-5	3.50E+01 - 2.00E+03	311	7	2.25	53	2000	1.29E+02	1.66E+02		1.35E+03
Pesticides (ug/kg)												
4,4'-DDD	Total	72-54-8	3.50E+00 - 2.00E+02	231	0	0.00			1.35E+01	1.32E+01		1.55E+04
4,4'-DDE	Total	72-55-9	3.50E+00 - 2.00E+02	231	1	0.43	4.1	4.1	1.35E+01	1.32E+01		1.10E+04
4,4'-DDT	Total	50-29-3	3.50E+00 - 2.00E+02	231	5	2.16	2.9	18	1.30E+01	1.23E+01		1.09E+04
Aldrin	Total	309-00-2	1.80E+00 - 9.90E+01	229	3	1.31	0	54	6.81E+00	7.06E+00		1.76E+02
alpha-BHC	Total	319-84-6	1.80E+00 - 9.90E+01	231	0	0.00			6.76E+00	6.59E+00		5.70E+02
alpha-Chlordane	Total	5103-71-9	1.80E+00 - 9.90E+02	229	2	0.87	0	0	6.23E+01	6.58E+01		1.03E+04
Atraton	Total	1610-17-9	5.00E+01 - 5.00E+01	4	0	0.00			2.50E+01	0.00E+00		
Atrazine	Total	1912-24-9	5.00E+01 - 4.10E+02	5	1	20.00	120	120	8.00E+01	8.11E+01		1.36E+04
beta-BHC	Total	319-85-7	1.80E+00 - 9.90E+01	231	3	1.30	0	28	6.68E+00	6.46E+00		1.99E+03
beta-Chlordane	Total	5103-74-2	1.80E+00 - 4.00E+02	157	0	0.00			4.88E+01	3.57E+01		1.03E+04
Chlordane	Total		2.30E+01 - 9.40E+01	2	0	0.00			2.93E+01	2.51E+01		1.03E+04
delta-BHC	Total	319-86-8	1.80E+00 - 9.90E+01	231	3	1.30	0	13	6.61E+00	6.32E+00		5.70E+02
Dieldrin	Total	60-57-1	3.50E+00 - 2.00E+02	231	1	0.43	4.6	4.6	1.35E+01	1.32E+01		1.87E+02
Endosulfan I	Total	959-98-8	1.80E+00 - 9.90E+01	231	3	1.30	0	20	6.60E+00	6.25E+00		4.81E+05

Table 5.3
Summary Statistics for Sediment

Analyte	Total or Dissolved	Derived CAS No.	Range of Reported Values for Nondetects	Total Number of Samples	Total Number of Detects	Detection Frequency (%)	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation	Background M2SD	WRW PRG
Endosulfan II	Total	33213-65-9	3.50E+00 - 2.00E+02	231	0	0.00			1.35E+01	1.32E+01		4.81E+05
Endosulfan Sulfate	Total	1031-07-8	3.50E+00 - 2.00E+02	231	0	0.00			1.35E+01	1.32E+01		4.81E+05
Endrin	Total	72-20-8	3.50E+00 - 2.00E+02	231	0	0.00			1.35E+01	1.32E+01		2.40E+04
Endrin Aldehyde	Total	7421-93-4	3.50E+00 - 2.70E+01	53	0	0.00			3.51E+00	2.89E+00		2.40E+04
Endrin Ketone	Total	53494-70-5	3.50E+00 - 2.00E+02	221	0	0.00			1.37E+01	1.34E+01		3.33E+04
gamma-BHC (Lindane)	Total	58-89-9	1.80E+00 - 9.90E+01	230	2	0.87	4.4	25	6.78E+00	6.68E+00		2.77E+03
gamma-Chlordane	Total	12789-03-6	3.70E+00 - 9.90E+02	72	2	2.78	0	0	9.17E+01	9.91E+01		1.03E+04
Heptachlor	Total	76-44-8	1.80E+00 - 9.90E+01	231	3	1.30	0	3.1	6.55E+00	6.31E+00		6.65E+02
Heptachlor Epoxide	Total	1024-57-3	1.80E+00 - 9.90E+01	231	3	1.30	0	33	6.90E+00	7.03E+00		3.29E+02
Hexachlorocyclopentadiene	Total	77-47-4	3.30E+02 - 3.60E+03	283	0	0.00			3.63E+02	2.53E+02		3.80E+05
Methoxychlor	Total	72-43-5	3.80E+00 - 9.90E+02	231	1	0.43	2.7	2.7	6.70E+01	6.61E+01		4.01E+05
Prometon	Total	1610-18-0	5.00E+01 - 5.00E+01	4	0	0.00			2.50E+01	0.00E+00		
Prometryn	Total	7287-19-6	5.00E+01 - 5.00E+01	4	0	0.00			2.50E+01	0.00E+00		
Propazine	Total	139-40-2	5.00E+01 - 5.00E+01	4	0	0.00			2.50E+01	0.00E+00		
Simazine	Total	122-34-9	5.00E+01 - 5.00E+01	4	0	0.00			2.50E+01	0.00E+00		2.50E+04
Simetryn	Total	1014-70-6	5.00E+01 - 5.00E+01	4	0	0.00			2.50E+01	0.00E+00		
Terbutryn	Total	886-50-0	5.00E+01 - 5.00E+01	4	0	0.00			2.50E+01	0.00E+00		
Terbutylazine	Total	5915-41-3	5.00E+01 - 5.00E+01	4	0	0.00			2.50E+01	0.00E+00		
Toxaphene	Total	8001-35-2	8.50E+01 - 2.30E+03	231	0	0.00			1.70E+02	1.51E+02		2.72E+03
Radionuclides (pCi/g)												
Americium-241	Total	86954-36-1	-3.70E-02 - 1.64E-01	462	340	73.59	0.001361	56.5	5.79E-01	3.06E+00	4.27E-02	7.69E+00
Cesium-134	Total	13967-70-9	1.00E-03 - 3.00E-01	137	75	54.74	-0.201	0.26	4.89E-02	6.28E-02	2.54E-01	8.00E-02
Cesium-137	Total	10045-97-3	3.00E-03 - 3.30E-01	226	172	76.11	-0.00176	1.498	1.87E-01	2.14E-01	9.60E-01	2.21E-01
Gross Alpha	Total	12587-47-2	-	259	259	100.00	-9.7	320	2.39E+01	2.63E+01	6.32E+01	
Gross Beta	Total	12587-46-1	-	264	264	100.00	4.95	125.2	2.92E+01	1.16E+01	5.62E+01	
Plutonium-239/240	Total		-1.60E-02 - 1.92E-01	482	401	83.20	-0.0083	217	1.81E+00	1.08E+01	5.09E-02	9.80E+00
Radium-226	Total	13982-63-3	7.90E-01 - 7.90E-01	113	112	99.12	-9.84	3.08	7.93E-01	1.23E+00	1.72E+00	2.69E+00
Radium-228	Total	15262-20-1	8.10E-01 - 8.10E-01	95	94	98.95	0.04	4.1	1.51E+00	5.32E-01	3.80E+00	1.11E-01
Strontium-89/90	Total		-1.40E-01 - 2.30E-01	200	149	74.50	-0.3	4.86	2.73E-01	5.56E-01	5.76E-01	1.32E+01
Uranium Isotopes	Total		-	388	388	100.00	0.33	70	2.95E+00	4.09E+00		2.28E+02
Uranium-233/234	Total		5.27E-01 - 5.27E-01	424	423	99.76	0.14	15	1.32E+00	1.09E+00	3.92E+00	2.53E+01
Uranium-235	Total	15117-96-1	-5.23E-02 - 3.38E-01	424	249	58.73	-0.0129	0.8517	6.00E-02	7.00E-02	1.52E-01	1.05E+00
Uranium-238	Total	7440-61-1	-	424	424	100.00	0	59	1.56E+00	3.07E+00	3.38E+00	2.93E+01
SVOCs (ug/kg)												
1,2,4-Trichlorobenzene	Total	120-82-1	9.63E-01 - 3.60E+03	313	1	0.32	2	2	2.92E+02	2.53E+02		1.51E+05
2,4,5-Trichlorophenol	Total	95-95-4	3.30E+02 - 1.00E+04	292	0	0.00			1.06E+03	6.57E+02		8.01E+06
2,4,6-Trichlorophenol	Total	88-06-2	3.30E+02 - 3.60E+03	292	0	0.00			3.57E+02	2.51E+02		2.72E+05
2,4-Dichlorophenol	Total	120-83-2	3.30E+02 - 3.60E+03	291	0	0.00			3.58E+02	2.51E+02		2.40E+05
2,4-Dimethylphenol	Total	105-67-9	3.30E+02 - 3.60E+03	291	0	0.00			3.58E+02	2.51E+02		1.60E+06
2,4-Dinitrophenol	Total	51-28-5	8.60E+02 - 1.80E+04	274	1	0.36	890	890	1.67E+03	1.32E+03		1.60E+05
2,4-Dinitrotoluene	Total	121-14-2	3.30E+02 - 3.60E+03	292	0	0.00			3.57E+02	2.51E+02		1.60E+05
2,6-Dinitrotoluene	Total	606-20-2	3.30E+02 - 3.60E+03	291	0	0.00			3.58E+02	2.51E+02		8.01E+04
2-Chloronaphthalene	Total	91-58-7	3.30E+02 - 3.60E+03	291	0	0.00			3.58E+02	2.51E+02		6.41E+06
2-Chlorophenol	Total	95-57-8	3.30E+02 - 3.60E+03	291	0	0.00			3.58E+02	2.51E+02		5.55E+05

Table 5.3
Summary Statistics for Sediment

Analyte	Total or Dissolved	Derived CAS No.	Range of Reported Values for Nondetects	Total Number of Samples	Total Number of Detects	Detection Frequency (%)	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation	Background M2SD	WRW PRG
2-Methylnaphthalene	Total	91-57-6	3.30E+02 - 3.60E+03	291	9	3.09	41	2000	3.59E+02	2.72E+02		3.21E+05
2-Methylphenol	Total	95-48-7	3.30E+02 - 3.60E+03	292	1	0.34	200	200	3.57E+02	2.51E+02		4.01E+06
2-Nitroaniline	Total	88-74-4	8.60E+02 - 1.80E+04	291	0	0.00			1.66E+03	1.30E+03		1.92E+05
2-Nitrophenol	Total	88-75-5	2.70E+02 - 3.60E+03	291	0	0.00			3.57E+02	2.51E+02		
3,3'-Dichlorobenzidine	Total	91-94-1	3.50E+02 - 7.10E+03	283	0	0.00			6.59E+02	5.11E+02		6.67E+03
3-Nitroaniline	Total	99-09-2	8.60E+02 - 1.80E+04	274	0	0.00			1.66E+03	1.32E+03		
4,6-Dinitro-2-methylphenol	Total	534-52-1	8.60E+02 - 1.80E+04	280	2	0.71	750	1100	1.64E+03	1.29E+03		8.01E+03
4-Bromophenyl-phenylether	Total	101-55-3	3.30E+02 - 3.60E+03	291	0	0.00			3.58E+02	2.51E+02		
4-Chloro-3-methylphenol	Total	59-50-7	3.30E+02 - 7.10E+03	291	0	0.00			5.01E+02	5.32E+02		
4-Chloroaniline	Total	106-47-8	3.30E+02 - 7.10E+03	284	0	0.00			5.05E+02	5.37E+02		3.21E+05
4-Chlorophenyl-phenyl ether	Total	7005-72-3	3.30E+02 - 3.60E+03	291	0	0.00			3.58E+02	2.51E+02		
4-Methylphenol	Total	106-44-5	3.30E+02 - 3.60E+03	293	9	3.07	47	1500	3.60E+02	2.62E+02		4.01E+05
4-Nitroaniline	Total	100-01-6	8.60E+02 - 1.80E+04	283	0	0.00			1.64E+03	1.30E+03		2.08E+05
Acenaphthene	Total	83-32-9	3.30E+02 - 2.10E+03	291	41	14.09	24	620	2.69E+02	1.49E+02		4.44E+06
Acenaphthylene	Total	208-96-8	3.30E+02 - 2.70E+03	291	0	0.00			2.85E+02	1.47E+02		
Anthracene	Total	120-12-7	3.30E+02 - 2.10E+03	291	76	26.12	19	970	2.58E+02	1.65E+02		2.22E+07
Benzo(a)anthracene	Total	56-55-3	3.30E+02 - 3.60E+03	291	126	43.30	22	1400	3.11E+02	2.84E+02		3.79E+03
Benzo(a)pyrene	Total	50-32-8	3.30E+02 - 3.60E+03	290	106	36.55	23	1300	3.37E+02	2.74E+02		3.79E+02
Benzo(b)fluoranthene	Total	205-99-2	3.30E+02 - 3.60E+03	290	111	38.28	25	1500	3.63E+02	3.10E+02		3.79E+03
Benzo(g,h,i)perylene	Total	191-24-2	3.30E+02 - 3.60E+03	287	72	25.09	35	1100	3.29E+02	2.61E+02		
Benzo(k)fluoranthene	Total	207-08-9	3.30E+02 - 3.60E+03	290	85	29.31	31	1200	3.37E+02	2.70E+02		3.79E+04
Benzoic Acid	Total	65-85-0	3.70E+02 - 1.80E+04	237	30	12.66	95	2700	1.67E+03	1.27E+03		3.21E+08
Benzyl Alcohol	Total	100-51-6	3.30E+02 - 7.10E+03	241	1	0.41	41	41	5.51E+02	5.67E+02		2.40E+07
bis(2-Chloroethoxy) Methane	Total	111-91-1	3.30E+02 - 3.60E+03	291	0	0.00			3.58E+02	2.51E+02		
bis(2-Chloroethyl) Ether	Total	111-44-4	3.30E+02 - 3.60E+03	291	0	0.00			3.58E+02	2.51E+02		3.77E+03
bis(2-Chloroisopropyl) Ether	Total	108-60-1	3.30E+02 - 3.60E+03	288	0	0.00			3.59E+02	2.52E+02		5.93E+04
bis(2-ethylhexyl)phthalate	Total	117-81-7	3.30E+02 - 3.60E+03	291	153	52.58	1	47000	7.77E+02	3.25E+03		2.14E+05
Butylbenzylphthalate	Total	85-68-7	3.30E+02 - 3.60E+03	291	16	5.50	21	1700	3.52E+02	2.68E+02		1.60E+07
Carbazole	Total	86-74-8	3.50E+02 - 1.00E+03	50	19	38.00	20	300	1.92E+02	1.10E+02		1.50E+05
Chrysene	Total	218-01-9	3.30E+02 - 3.60E+03	292	142	48.63	22	1500	3.27E+02	2.95E+02		3.79E+05
Dibenz(a,h)anthracene	Total	53-70-3	3.30E+02 - 3.60E+03	289	22	7.61	21	530	3.42E+02	2.47E+02		3.79E+02
Dibenzofuran	Total	132-64-9	3.30E+02 - 3.60E+03	291	11	3.78	20	300	3.54E+02	2.54E+02		2.22E+05
Diethylphthalate	Total	84-66-2	3.30E+02 - 3.60E+03	292	3	1.03	25	79	3.57E+02	2.52E+02		6.41E+07
Dimethylphthalate	Total	131-11-3	3.30E+02 - 3.60E+03	291	4	1.37	75	490	3.55E+02	2.52E+02		8.01E+08
Di-n-butylphthalate	Total	84-74-2	3.40E+02 - 3.60E+03	292	68	23.29	28	390	3.20E+02	2.71E+02		8.01E+06
Di-n-octylphthalate	Total	117-84-0	3.30E+02 - 3.60E+03	291	23	7.90	21	9800	4.23E+02	6.84E+02		3.21E+06
Fluoranthene	Total	206-44-0	3.30E+02 - 3.60E+03	292	160	54.79	31	3100	4.51E+02	4.81E+02		2.96E+06
Fluorene	Total	86-73-7	3.30E+02 - 3.60E+03	291	28	9.62	21	650	3.44E+02	2.52E+02		3.21E+06
Hexachlorobenzene	Total	118-74-1	3.30E+02 - 3.60E+03	292	0	0.00			3.57E+02	2.51E+02		1.87E+03
Hexachlorobutadiene	Total	87-68-3	1.13E+00 - 3.60E+03	313	1	0.32	2	2	2.92E+02	2.53E+02		2.22E+04
Indeno(1,2,3-cd)pyrene	Total	193-39-5	3.30E+02 - 3.60E+03	288	80	27.78	23	910	3.17E+02	2.59E+02		3.79E+03
Isophorone	Total	78-59-1	2.70E+02 - 3.60E+03	291	0	0.00			3.57E+02	2.51E+02		3.16E+06
Naphthalene	Total	91-20-3	8.15E-01 - 3.60E+03	313	20	6.39	1.1	320	2.90E+02	2.53E+02		1.40E+06
Nitrobenzene	Total	98-95-3	3.30E+02 - 3.60E+03	292	0	0.00			3.57E+02	2.51E+02		4.32E+04

Table 5.3
Summary Statistics for Sediment

Analyte	Total or Dissolved	Derived CAS No.	Range of Reported Values for Nondetects	Total Number of Samples	Total Number of Detects	Detection Frequency (%)	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation	Background M2SD	WRW PRG
N-Nitroso-di-n-propylamine	Total	621-64-7	3.30E+02 - 3.60E+03	291	0	0.00			3.58E+02	2.51E+02		4.29E+02
n-Nitrosodiphenylamine	Total	86-30-6	3.30E+02 - 3.60E+03	291	0	0.00			3.58E+02	2.51E+02		6.12E+05
Pentachlorophenol	Total	87-86-5	3.30E+02 - 1.80E+04	292	6	2.05	39	1500	1.62E+03	1.27E+03		1.76E+04
Phenanthrene	Total	85-01-8	3.30E+02 - 3.60E+03	292	145	49.66	24	3300	3.78E+02	4.12E+02		
Phenol	Total	108-95-2	3.40E+02 - 3.60E+03	291	5	1.72	22	150	3.53E+02	2.52E+02		2.40E+07
Pyrene	Total	129-00-0	3.30E+02 - 3.60E+03	292	139	47.60	20	3900	4.43E+02	4.55E+02		2.22E+06
VOCs (ug/kg)												
1,1,1,2-Tetrachloroethane	Total	630-20-6	9.52E-01 - 2.30E+01	49	0	0.00			2.80E+00	2.23E+00		9.10E+04
1,1,1-Trichloroethane	Total	71-55-6	8.41E-01 - 1.60E+03	248	1	0.40	9	9	1.27E+01	7.66E+01		9.18E+06
1,1,2,2-Tetrachloroethane	Total	79-34-5	9.28E-01 - 1.60E+03	247	1	0.40	2	2	1.28E+01	7.68E+01		1.05E+04
1,1,2-Trichloro-1,2,2-trifluoroethane	Total	76-13-1	8.40E-01 - 2.30E+01	49	0	0.00			2.84E+00	2.19E+00		2.38E+09
1,1,2-Trichloroethane	Total	79-00-5	9.22E-01 - 1.60E+03	248	0	0.00			1.27E+01	7.66E+01		2.80E+04
1,1-Dichloroethane	Total	75-34-3	7.73E-01 - 1.60E+03	249	0	0.00			1.27E+01	7.65E+01		2.72E+06
1,1-Dichloroethene	Total	75-35-4	8.73E-01 - 1.60E+03	248	1	0.40	2	2	1.01E+01	6.50E+01		1.74E+04
1,1-Dichloropropene	Total	563-58-6	6.06E-01 - 2.30E+01	49	0	0.00			2.80E+00	2.23E+00		
1,2,3-Trichlorobenzene	Total	87-61-6	6.96E-01 - 2.30E+01	49	1	2.04	2	2	2.78E+00	2.23E+00		
1,2,3-Trichloropropane	Total	96-18-4	1.03E+00 - 2.30E+01	49	0	0.00			2.77E+00	2.25E+00		2.08E+03
1,2,4-Trimethylbenzene	Total	95-63-6	7.20E-01 - 2.30E+01	49	6	12.24	1.4	4.6	2.69E+00	2.29E+00		1.33E+05
1,2-Dibromoethane	Total	106-93-4	8.16E-01 - 2.30E+01	49	0	0.00			2.77E+00	2.25E+00		3.51E+01
1,2-Dichlorobenzene	Total	95-50-1	7.27E-01 - 2.70E+03	264	0	0.00			2.28E+02	1.65E+02		2.89E+06
1,2-Dichloroethane	Total	107-06-2	9.91E-01 - 1.60E+03	245	1	0.41	5	5	1.28E+01	7.71E+01		1.33E+04
1,2-Dichloroethene	Total	540-59-0	5.00E+00 - 1.60E+03	200	1	0.50	3	3	1.51E+01	8.52E+01		1.00E+06
1,2-Dichloropropane	Total	78-87-5	7.47E-01 - 1.60E+03	248	0	0.00			1.27E+01	7.66E+01		3.84E+04
1,3,5-Trimethylbenzene	Total	108-67-8	7.55E-01 - 2.30E+01	49	0	0.00			2.74E+00	2.29E+00		1.14E+05
1,3-Dichlorobenzene	Total	541-73-1	9.11E-01 - 3.60E+03	313	0	0.00			2.92E+02	2.53E+02		3.33E+06
1,3-Dichloropropane	Total	142-28-9	5.76E-01 - 2.30E+01	49	0	0.00			2.72E+00	2.31E+00		
1,4-Dichlorobenzene	Total	106-46-7	1.10E+00 - 2.70E+03	264	0	0.00			2.28E+02	1.65E+02		9.13E+04
1,4-Dioxane	Total	123-91-1	5.00E+02 - 5.00E+02	1	0	0.00			2.50E+02			3.78E+05
2,2-Dichloropropane	Total	594-20-7	6.67E-01 - 2.30E+01	49	0	0.00			2.77E+00	2.25E+00		
2-Butanone	Total	78-93-3	3.89E+00 - 3.10E+03	246	37	15.04	2	380	2.33E+01	1.17E+02		4.64E+07
2-Chlorotoluene	Total	95-49-8	6.80E-01 - 2.30E+01	49	0	0.00			2.84E+00	2.19E+00		2.22E+06
2-Hexanone	Total	591-78-6	2.20E+00 - 3.10E+03	239	0	0.00			2.00E+01	1.15E+02		
2-Methyl-1-propanol	Total	78-83-1	1.00E+02 - 1.00E+02	1	0	0.00			5.00E+01			3.33E+07
4-Chlorotoluene	Total	106-43-4	8.91E-01 - 2.30E+01	49	0	0.00			2.75E+00	2.27E+00		
4-Isopropyltoluene	Total	99-87-6	9.90E-01 - 2.30E+01	49	1	2.04	39	39	3.56E+00	5.63E+00		
4-Methyl-2-pentanone	Total	108-10-1	2.78E+00 - 3.10E+03	247	2	0.81	3	6	1.94E+01	1.14E+02		8.32E+07
Acetone	Total	67-64-1	3.79E+00 - 3.30E+03	250	51	20.40	3	890	4.67E+01	1.41E+02		1.00E+08
Acetonitrile	Total	75-05-8	1.00E+02 - 1.00E+02	1	0	0.00			5.00E+01			
Benzene	Total	71-43-2	8.09E-01 - 1.60E+03	247	1	0.40	3	3	1.01E+01	6.51E+01		2.36E+04
Bromobenzene	Total	108-86-1	9.54E-01 - 2.30E+01	49	0	0.00			2.80E+00	2.23E+00		
Bromochloromethane	Total	74-97-5	1.03E+00 - 2.30E+01	49	0	0.00			2.80E+00	2.22E+00		
Bromodichloromethane	Total	75-27-4	6.78E-01 - 1.60E+03	248	0	0.00			1.27E+01	7.66E+01		6.71E+04
Bromoform	Total	75-25-2	6.68E-01 - 1.60E+03	248	0	0.00			1.27E+01	7.66E+01		4.20E+05
Bromomethane	Total	74-83-9	1.58E+00 - 3.10E+03	248	6	2.42	2	5	1.83E+01	1.13E+02		2.10E+04

Table 5.3
Summary Statistics for Sediment

Analyte	Total or Dissolved	Derived CAS No.	Range of Reported Values for Nondetects	Total Number of Samples	Total Number of Detects	Detection Frequency (%)	Minimum Detected Concentration	Maximum Detected Concentration	Arithmetic Mean Concentration	Standard Deviation	Background M2SD	WRW PRG
Carbon Disulfide	Total	75-15-0	8.98E-01 - 1.60E+03	249	0	0.00			1.28E+01	7.65E+01		1.64E+06
Carbon Tetrachloride	Total	56-23-5	8.23E-01 - 1.60E+03	248	2	0.81	390	440	1.08E+01	6.24E+01		8.45E+03
Chlorobenzene	Total	108-90-7	7.17E-01 - 1.60E+03	246	0	0.00			1.02E+01	6.52E+01		6.67E+05
Chloroethane	Total	75-00-3	1.68E+00 - 3.10E+03	248	0	0.00			1.83E+01	1.13E+02		1.43E+06
Chloroform	Total	67-66-3	7.77E-01 - 1.60E+03	249	5	2.01	1	2	1.27E+01	7.65E+01		7.85E+03
Chloromethane	Total	74-87-3	1.26E+00 - 3.10E+03	244	0	0.00			1.85E+01	1.14E+02		1.15E+05
cis-1,2-Dichloroethene	Total	156-59-2	1.05E+00 - 1.20E+01	49	1	2.04	48	48	3.14E+00	6.67E+00		1.11E+06
cis-1,3-Dichloropropene	Total	10061-01-5	8.14E-01 - 1.60E+03	248	0	0.00			1.27E+01	7.66E+01		1.94E+04
Dibromochloromethane	Total	124-48-1	7.20E-01 - 1.60E+03	248	0	0.00			1.27E+01	7.66E+01		4.95E+04
Dibromomethane	Total	74-95-3	7.52E-01 - 2.30E+01	49	0	0.00			2.76E+00	2.26E+00		
Dichlorodifluoromethane	Total	75-71-8	1.88E+00 - 2.30E+01	49	0	0.00			3.07E+00	2.11E+00		2.30E+05
Ether	Total	60-29-7	1.00E+01 - 1.00E+01	1	0	0.00			5.00E+00			2.22E+07
Ethyl Acetate	Total	141-78-6	1.00E+01 - 1.00E+01	1	0	0.00			5.00E+00			1.00E+08
Ethylbenzene	Total	100-41-4	6.57E-01 - 1.60E+03	247	2	0.81	1.4	9	1.28E+01	7.68E+01		5.39E+06
Gasoline	Total	8006-61-9	6.00E+02 - 1.50E+03	2	0	0.00			5.25E+02	3.18E+02		
Hexachloroethane	Total	67-72-1	3.30E+02 - 3.60E+03	292	0	0.00			3.57E+02	2.51E+02		1.11E+05
Isopropylbenzene	Total	98-82-8	5.16E-01 - 2.30E+01	49	0	0.00			2.80E+00	2.22E+00		3.27E+04
Methylene Chloride	Total	75-09-2	1.02E+00 - 8.30E+03	255	55	21.57	2	420	3.07E+01	2.63E+02		2.72E+05
n-Butanol	Total	71-36-3	1.00E+02 - 1.00E+02	1	0	0.00			5.00E+01			
n-Butylbenzene	Total	104-51-8	1.02E+00 - 2.30E+01	49	0	0.00			2.77E+00	2.25E+00		
n-Propylbenzene	Total	103-65-1	8.28E-01 - 2.30E+01	49	0	0.00			2.78E+00	2.24E+00		
Pyridine	Total	110-86-1	3.70E+02 - 3.60E+03	76	0	0.00			5.83E+02	3.45E+02		
sec-Butylbenzene	Total	135-98-8	7.86E-01 - 2.30E+01	49	0	0.00			2.78E+00	2.25E+00		
Styrene	Total	100-42-5	8.74E-01 - 1.60E+03	247	0	0.00			1.28E+01	7.68E+01		1.38E+07
tert-Butylbenzene	Total	98-06-6	1.05E+00 - 2.30E+01	49	0	0.00			2.78E+00	2.24E+00		
Tetrachloroethene	Total	127-18-4	1.25E+00 - 1.60E+03	247	7	2.83	1	38	1.29E+01	7.68E+01		6.71E+03
Toluene	Total	108-88-3	8.78E-01 - 1.30E+03	250	60	24.00	0.42	860	3.09E+01	1.05E+02		3.09E+06
Total Xylenes	Total	1330-20-7	2.65E+00 - 1.60E+03	247	5	2.02	5	68	1.32E+01	7.68E+01		1.06E+06
trans-1,2-Dichloroethene	Total	156-60-5	1.09E+00 - 1.20E+01	49	1	2.04	2	2	2.19E+00	1.25E+00		2.87E+05
trans-1,3-Dichloropropene	Total	10061-02-6	9.23E-01 - 1.60E+03	248	0	0.00			1.27E+01	7.66E+01		2.08E+04
Trichloroethene	Total	79-01-6	6.55E-01 - 1.60E+03	248	6	2.42	1.1	48	1.04E+01	6.50E+01		1.77E+03
Trichlorofluoromethane	Total	75-69-4	9.35E-01 - 2.30E+01	49	13	26.53	1	5	2.70E+00	2.25E+00		1.51E+06
Vinyl Acetate	Total	108-05-4	1.00E+01 - 3.80E+01	148	0	0.00			8.20E+00	2.57E+00		2.65E+06
Vinyl Chloride	Total	75-01-4	2.45E+00 - 3.10E+03	249	1	0.40	16.8	16.8	1.83E+01	1.13E+02		2.17E+03
Water Quality Parameters (ug/kg)												
Chloride	Total	16887-00-6	2.50E+04 - 2.50E+04	32	22	68.75	13000	393990	8.01E+04	9.54E+04		
Cyanide	Total	57-12-5	2.70E+02 - 5.00E+03	7	1	14.29	230	230	8.29E+02	1.14E+03		2.22E+06
Fluoride	Total	16984-48-8	8.75E+02 - 2.50E+03	42	22	52.38	831	20300	3.33E+03	4.14E+03		6.67E+06
Nitrate/Nitrite (as N)	Total	ConID 184	1.00E+02 - 2.28E+04	124	81	65.32	300	76000	4.68E+03	1.11E+04	3.84E+04	1.78E+08
Nitrate (as N)	Total	ConID 184	2.00E+02 - 3.84E+03	69	25	36.23	157	89310	3.74E+03	1.17E+04	3.84E+04	1.78E+08
Nitrite (as N)	Total	ConID 187	2.00E+01 - 2.50E+03	36	1	2.78	5610	5610	9.78E+02	9.73E+02	4.03E+02	1.11E+07
Silica	Total	7631-86-9	-	106	106	100.00	259000	4900000	1.26E+06	6.76E+05	9.57E+05	
Sulfate	Total	14808-79-8	2.50E+04 - 2.50E+04	32	10	31.25	3810	95910	1.66E+04	1.80E+04		
Sulfide	Total	18496-25-8	-	1	1	100.00	37000	37000	3.70E+04			

Table 5.4
Surface Water AOI Screening for Results From January 1, 2000 to July 31, 2005

										AOI Screen 1	AOI Screen 2				AOI Screen 3				AOI Screen 4	AOI Screen 5	
Analyte Group	Analyte	Total or Dissolved	Derived CAS No.	Number of Samples	Number of Detections	Frequency of Detections (%)	Maximum Concentration	Data Qualifier	Unit	Is There a Surface Water Standard ?	Background M2SD	Number of Detections Above the Background M2SD	Frequency of Detection (%) Above the Background M2SD	Is the Maximum Concentration Above the Background M2SD ?	Lowest Surface Water Standard or PQL	Number of Detections Above the Lowest Surface Water Standard or PQL	Frequency of Detection (%) Above the Surface Water Standard or PQL	Is the Maximum Result Above the Surface Water Standard or PQL ?	Is the Frequency of Detection Above the Surface Water Standard ≥ 1% ?	Is Constituent Eliminated or Retained By Process Knowledge ?	Is Constituent an AOI ?
HERB	4-Nitrophenol	T	100-02-7	32	0	0.00	8.40E+01	U	ug/L	Yes	-----	-----	-----	-----	56	0	0.00	-----	No	-----	No
MET	Arsenic	D		74	18	24.32	4.10E+00	B	ug/L	Yes	1.19E+01	0	0.00E+00	No	5	0	0.00	No	No	-----	No
MET	Boron	T	7440-42-8	10	6	60.00	1.80E+02		ug/L	Yes	-----	-----	-----	-----	750	0	0.00	No	No	-----	No
MET	Cadmium	D		432	138	31.94	2.10E+00		ug/L	Yes	4.74E+00	0	0.00E+00	No	5	0	0.00	No	No	-----	No
MET	Chromium	D		74	35	47.30	7.60E+00		ug/L	Yes	8.03E+00	0	0.00E+00	No	99.3	0	0.00	No	No	-----	No
MET	Copper	D		74	48	64.86	9.50E+00		ug/L	Yes	1.67E+01	0	0.00E+00	No	12.1	0	0.00	No	No	-----	No
MET	Lead	D	7439-92-1	74	11	14.86	5.62E+00		ug/L	Yes	8.32E+00	0	0.00E+00	No	10	0	0.00	No	No	-----	No
MET	Mercury	D		74	10	13.51	3.10E-01		ug/L	Yes	9.59E-01	0	0.00E+00	No	1.4	0	0.00	No	No	-----	No
MET	Nickel	D	7440-02-0	74	45	60.81	6.00E+00	B	ug/L	Yes	2.78E+01	0	0.00E+00	No	70.4	0	0.00	No	No	-----	No
MET	Selenium	T	7782-49-2	960	410	42.71	1.90E+01		ug/L	Yes	7.41E+00	2	2.08E-01	Yes	20	0	0.00	No	No	-----	No
MET	Selenium	D	7782-49-2	74	38	51.35	8.90E+00	N	ug/L	Yes	6.17E+00	3	4.05E+00	Yes	10	0	0.00	No	No	-----	No
MET	Silver	T	7440-22-4	962	184	19.13	7.36E+01		ug/L	Yes	6.41E+00	2	2.08E-01	Yes	100	0	0.00	No	No	-----	No
MET	Thallium	T	7440-28-0	961	72	7.49	7.10E+00		ug/L	Yes	2.73E+01	0	0.00E+00	No	12	0	0.00	No	No	-----	No
MET	Thallium	D	7440-28-0	72	10	13.89	4.10E+00		ug/L	Yes	3.05E+01	0	0.00E+00	No	12	0	0.00	No	No	-----	No
MET	Uranium	D		55	16	29.09	1.03E+01		pCi/L	Yes	-----	-----	-----	-----	2442	0	0.00	No	No	-----	No
PCB	PCB-1016	T	12674-11-2	9	0	0.00	5.00E-01	U	ug/L	Yes	-----	-----	-----	-----	1	0	0.00	-----	No	-----	No
PCB	PCB-1221	T	11104-28-2	9	0	0.00	5.00E-01	U	ug/L	Yes	-----	-----	-----	-----	1	0	0.00	-----	No	-----	No
PCB	PCB-1232	T	11141-16-5	9	0	0.00	5.00E-01	U	ug/L	Yes	-----	-----	-----	-----	1	0	0.00	-----	No	-----	No
PCB	PCB-1242	T	53469-21-9	9	0	0.00	5.00E-01	U	ug/L	Yes	-----	-----	-----	-----	1	0	0.00	-----	No	-----	No
PCB	PCB-1248	T	12672-29-6	9	0	0.00	5.00E-01	U	ug/L	Yes	-----	-----	-----	-----	1	0	0.00	-----	No	-----	No
PCB	PCB-1254	T	11097-69-1	9	2	22.22	7.00E-01		ug/L	Yes	-----	-----	-----	-----	1	0	0.00	No	No	-----	No
PCB	PCB-1260	T	11096-82-5	9	0	0.00	5.00E-01	U	ug/L	Yes	-----	-----	-----	-----	1	0	0.00	-----	No	-----	No
PEST	Hexachlorocyclopentadiene	T	77-47-4	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
RAD	Neptunium-237	T	13994-20-2	19	1	5.26	2.38E-01		pCi/L	Yes	-----	-----	-----	-----	30	0	0.00	No	No	-----	No
RAD	Uranium Isotopes	D		33	33	100.00	1.80E+01		pCi/L	Yes	-----	-----	-----	-----	2442	0	0.00	No	No	-----	No
RAD	Uranium-235	T	15117-96-1	1916	1092	56.99	9.82E-01		pCi/L	Yes	1.78E-01	110	5.74E+00	Yes	10	0	0.00	No	No	-----	No
SVOC	1,2,4,5-Tetrachlorobenzene	T	95-94-3	3	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	1,2,4-Trichlorobenzene	T	120-82-1	164	4	2.44	2.00E-01		ug/L	Yes	-----	-----	-----	-----	35	0	0.00	No	No	-----	No
SVOC	2,4,5-Trichlorophenol	T	95-95-4	32	0	0.00	8.40E+01	U	ug/L	Yes	-----	-----	-----	-----	700	0	0.00	-----	No	-----	No

Table 5.4
Surface Water AOI Screening for Results From January 1, 2000 to July 31, 2005

Analyte Group	Analyte	Total or Dissolved	Derived CAS No.	Number of Samples	Number of Detections	Frequency of Detections (%)	Maximum Concentration	Data Qualifier	Unit	AOI Screen 1	AOI Screen 2				AOI Screen 3				AOI Screen 4	AOI Screen 5	Is Constituent an AOI ?
										Is There a Surface Water Standard ?	Background M2SD	Number of Detections Above the Background M2SD	Frequency of Detection (%) Above the Background M2SD	Is the Maximum Concentration Above the Background M2SD ?	Lowest Surface Water Standard or PQL	Number of Detections Above the Lowest Surface Water Standard or PQL	Frequency of Detection (%) Above the Surface Water Standard or PQL	Is the Maximum Result Above the Surface Water Standard or PQL ?	Is the Frequency of Detection Above the Surface Water Standard ≥ 1% ?	Is Constituent Eliminated or Retained By Process Knowledge ?	
SVOC	2,4,6-Trichlorophenol	T	88-06-2	32	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	50	0	0.00	-----	No	-----	No
SVOC	2,4-Dichlorophenol	T	120-83-2	32	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	50	0	0.00	-----	No	-----	No
SVOC	2,4-Dimethylphenol	T	105-67-9	32	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	140	0	0.00	-----	No	-----	No
SVOC	2,4-Dinitrophenol	T	51-28-5	32	0	0.00	8.40E+01	U	ug/L	Yes	-----	-----	-----	-----	50	0	0.00	-----	No	-----	No
SVOC	2,4-Dinitrotoluene	T	121-14-2	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	2,6-Dinitrotoluene	T	606-20-2	32	0	0.00	1.12E+01	U	ug/L	Yes	-----	-----	-----	-----	230	0	0.00	-----	No	-----	No
SVOC	2-Chloronaphthalene	T	91-58-7	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	560	0	0.00	-----	No	-----	No
SVOC	2-Chlorophenol	T	95-57-8	32	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	50	0	0.00	-----	No	-----	No
SVOC	2-Methylphenol	T	95-48-7	29	0	0.00	1.12E+01	U	ug/L	Yes	-----	-----	-----	-----	1830	0	0.00	-----	No	-----	No
SVOC	3,3'-Dichlorobenzidine	T	91-94-1	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	4,6-Dinitro-2-methylphenol	T	534-52-1	32	0	0.00	8.40E+01	U	ug/L	Yes	-----	-----	-----	-----	50	0	0.00	-----	No	-----	No
SVOC	4-Chloro-3-methylphenol	T	59-50-7	32	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	50	0	0.00	-----	No	-----	No
SVOC	Acenaphthene	T	83-32-9	35	3	8.57	2.70E+00	J	ug/L	Yes	-----	-----	-----	-----	420	0	0.00	No	No	-----	No
SVOC	Acenaphthylene	T	208-96-8	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	Aniline	T	62-53-3	1	0	0.00	1.00E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	Anthracene	T	120-12-7	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	2100	0	0.00	-----	No	-----	No
SVOC	Aramite	T	140-57-8	3	0	0.00	6.70E+01	U	ug/L	Yes	-----	-----	-----	-----	20	0	0.00	-----	No	-----	No
SVOC	Benzo(a)anthracene	T	56-55-3	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	Benzo(a)pyrene	T	50-32-8	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	0.2	0	0.00	-----	No	-----	No
SVOC	Benzo(b)fluoranthene	T	205-99-2	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	Benzo(g,h,i)perylene	T	191-24-2	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	Benzo(k)fluoranthene	T	207-08-9	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	bis(2-Chloroethyl) ether	T	111-44-4	32	0	0.00	1.12E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	bis(2-Chloroisopropyl) ether	T	108-60-1	32	0	0.00	1.12E+01	U	ug/L	Yes	-----	-----	-----	-----	280	0	0.00	-----	No	-----	No
SVOC	bis(2-ethylhexyl)phthalate	T	117-81-7	32	2	6.25	2.00E+00	JB	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	No	No	-----	No
SVOC	Butylbenzylphthalate	T	85-68-7	35	3	8.57	2.00E+00	J	ug/L	Yes	-----	-----	-----	-----	1400	0	0.00	No	No	-----	No
SVOC	Chrysene	T	218-01-9	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	Dibenz(a,h)anthracene	T	53-70-3	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	Diethylphthalate	T	84-66-2	35	3	8.57	2.00E+00	J	ug/L	Yes	-----	-----	-----	-----	5600	0	0.00	No	No	-----	No

Table 5.4
Surface Water AOI Screening for Results From January 1, 2000 to July 31, 2005

										AOI Screen 1	AOI Screen 2				AOI Screen 3				AOI Screen 4	AOI Screen 5	
Analyte Group	Analyte	Total or Dissolved	Derived CAS No.	Number of Samples	Number of Detections	Frequency of Detections (%)	Maximum Concentration	Data Qualifier	Unit	Is There a Surface Water Standard ?	Background M2SD	Number of Detections Above the Background M2SD	Frequency of Detection (%) Above the Background M2SD	Is the Maximum Concentration Above the Background M2SD ?	Lowest Surface Water Standard or PQL	Number of Detections Above the Lowest Surface Water Standard or PQL	Frequency of Detection (%) Above the Surface Water Standard or PQL	Is the Maximum Result Above the Surface Water Standard or PQL ?	Is the Frequency of Detection Above the Surface Water Standard ≥ 1% ?	Is Constituent Eliminated or Retained By Process Knowledge ?	Is Constituent an AOI ?
SVOC	Dimethylphthalate	T	131-11-3	35	3	8.57	3.60E+00	J	ug/L	Yes	-----	-----	-----	-----	70000	0	0.00	No	No	-----	No
SVOC	Di-n-butylphthalate	T	84-74-2	35	5	14.29	6.00E+00	JB	ug/L	Yes	-----	-----	-----	-----	700	0	0.00	No	No	-----	No
SVOC	Fluoranthene	T	206-44-0	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	130	0	0.00	-----	No	-----	No
SVOC	Fluorene	T	86-73-7	35	3	8.57	2.60E+00	J	ug/L	Yes	-----	-----	-----	-----	280	0	0.00	No	No	-----	No
SVOC	Hexachlorobenzene	T	118-74-1	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	Hexachlorobutadiene	T	87-68-3	164	2	1.22	6.80E-01	JB	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	No	No	-----	No
SVOC	Indeno(1,2,3-cd)pyrene	T	193-39-5	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	Isophorone	T	78-59-1	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	36	0	0.00	-----	No	-----	No
SVOC	Naphthalene	T	91-20-3	164	25	15.24	2.70E+01		ug/L	Yes	-----	-----	-----	-----	28	0	0.00	No	No	-----	No
SVOC	Nitrobenzene	T	98-95-3	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	N-Nitrosodiethylamine	T	55-18-5	3	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	N-Nitrosodimethylamine	T	62-75-9	3	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	N-Nitrosodi-n-butylamine	T	924-16-3	3	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	N-Nitroso-di-n-propylamine	T	621-64-7	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	n-Nitrosodiphenylamine	T	86-30-6	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	N-Nitrosomethylethylamine	T	10595-95-6	3	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	0.0016	0	0.00	-----	No	-----	No
SVOC	N-Nitrosopyrrolidine	T	930-55-2	3	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	Parathion	T	56-38-2	3	0	0.00	5.20E-01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	Pentachlorobenzene	T	608-93-5	3	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
SVOC	Pentachlorophenol	T	87-86-5	32	0	0.00	8.40E+01	U	ug/L	Yes	-----	-----	-----	-----	50	0	0.00	-----	No	-----	No
SVOC	Phenanthrene	T	85-01-8	35	2	5.71	3.50E+00	J	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	No	No	-----	No
SVOC	Phenol	T	108-95-2	32	2	6.25	3.50E+00	J	ug/L	Yes	-----	-----	-----	-----	2100	0	0.00	No	No	-----	No
SVOC	Pyrene	T	129-00-0	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	210	0	0.00	-----	No	-----	No
VOC	1,1,1-Trichloroethane	T	71-55-6	207	11	5.31	4.00E+00	J	ug/L	Yes	-----	-----	-----	-----	200	0	0.00	No	No	-----	No
VOC	1,1,2,2-Tetrachloroethane	T	79-34-5	207	1	0.48	1.00E-01	J	ug/L	Yes	-----	-----	-----	-----	1	0	0.00	No	No	-----	No
VOC	1,1,2-Trichloroethane	T	79-00-5	207	0	0.00	1.00E+01	U	ug/L	Yes	-----	-----	-----	-----	2.7	0	0.00	-----	No	-----	No
VOC	1,1-Dichloroethane	T	75-34-3	207	32	15.46	3.00E+00		ug/L	Yes	-----	-----	-----	-----	3650	0	0.00	No	No	-----	No
VOC	1,1-Dichloroethene	T	75-35-4	207	7	3.38	5.00E+00		ug/L	Yes	-----	-----	-----	-----	7	0	0.00	No	No	-----	No
VOC	1,2-Dibromoethane	T	106-93-4	151	0	0.00	5.00E+00	U	ug/L	Yes	-----	-----	-----	-----	1	0	0.00	-----	No	-----	No

Table 5.4
Surface Water AOI Screening for Results From January 1, 2000 to July 31, 2005

Analyte Group	Analyte	Total or Dissolved	Derived CAS No.	Number of Samples	Number of Detections	Frequency of Detections (%)	Maximum Concentration	Data Qualifier	Unit	AOI Screen 1	AOI Screen 2				AOI Screen 3				AOI Screen 4	AOI Screen 5	Is Constituent an AOI ?
										Is There a Surface Water Standard ?	Background M2SD	Number of Detections Above the Background M2SD	Frequency of Detection (%) Above the Background M2SD	Is the Maximum Concentration Above the Background M2SD ?	Lowest Surface Water Standard or PQL	Number of Detections Above the Lowest Surface Water Standard or PQL	Frequency of Detection (%) Above the Surface Water Standard or PQL	Is the Maximum Result Above the Surface Water Standard or PQL ?	Is the Frequency of Detection Above the Surface Water Standard ≥ 1% ?	Is Constituent Eliminated or Retained By Process Knowledge ?	
VOC	1,2-Dichlorobenzene	T	95-50-1	218	22	10.09	4.00E-01	J	ug/L	Yes	-----	-----	-----	-----	420	0	0.00	No	No	-----	No
VOC	1,2-Dichloroethane	T	107-06-2	192	0	0.00	1.00E+01	U	ug/L	Yes	-----	-----	-----	-----	1	0	0.00	-----	No	-----	No
VOC	1,2-Dichloroethene	T	540-59-0	2	0	0.00	1.00E+01	U	ug/L	Yes	-----	-----	-----	-----	70	0	0.00	-----	No	-----	No
VOC	1,2-Dichloropropane	T	78-87-5	207	0	0.00	1.00E+01	U	ug/L	Yes	-----	-----	-----	-----	1	0	0.00	-----	No	-----	No
VOC	1,3-Dichlorobenzene	T	541-73-1	218	10	4.59	8.20E-01	J	ug/L	Yes	-----	-----	-----	-----	94	0	0.00	No	No	-----	No
VOC	1,4-Dichlorobenzene	T	106-46-7	218	23	10.55	5.30E-01	J	ug/L	Yes	-----	-----	-----	-----	63	0	0.00	No	No	-----	No
VOC	2-Butanone	T	78-93-3	140	4	2.86	1.60E+01		ug/L	Yes	-----	-----	-----	-----	21900	0	0.00	No	No	-----	No
VOC	4-Methyl-2-pentanone	T	108-10-1	148	0	0.00	5.00E+01	U	ug/L	Yes	-----	-----	-----	-----	2920	0	0.00	-----	No	-----	No
VOC	Acetone	T	67-64-1	142	50	35.21	6.31E+01	J	ug/L	Yes	-----	-----	-----	-----	3650	0	0.00	No	No	-----	No
VOC	Bromodichloromethane	T	75-27-4	207	1	0.48	2.90E-01	J	ug/L	Yes	-----	-----	-----	-----	1	0	0.00	No	No	-----	No
VOC	Bromoform	T	75-25-2	207	2	0.97	1.90E+00		ug/L	Yes	-----	-----	-----	-----	4.3	0	0.00	No	No	-----	No
VOC	Bromomethane	T	74-83-9	207	0	0.00	1.00E+01	U	ug/L	Yes	-----	-----	-----	-----	9.8	0	0.00	-----	No	-----	No
VOC	Carbon Disulfide	T	75-15-0	148	1	0.68	1.00E-01	J	ug/L	Yes	-----	-----	-----	-----	3650	0	0.00	No	No	-----	No
VOC	Chlorobenzene	T	108-90-7	207	21	10.14	9.50E-01	J	ug/L	Yes	-----	-----	-----	-----	100	0	0.00	No	No	-----	No
VOC	Chloroethane	T	75-00-3	207	25	12.08	2.40E+01		ug/L	Yes	-----	-----	-----	-----	29.4	0	0.00	No	No	-----	No
VOC	Chloromethane	T	74-87-3	207	5	2.42	2.80E+00		ug/L	Yes	-----	-----	-----	-----	5.6	0	0.00	No	No	-----	No
VOC	cis-1,3-Dichloropropene	T	10061-01-5	207	0	0.00	1.00E+01	U	ug/L	Yes	-----	-----	-----	-----	1	0	0.00	-----	No	-----	No
VOC	Dibromochloromethane	T	124-48-1	207	0	0.00	1.00E+01	U	ug/L	Yes	-----	-----	-----	-----	54	0	0.00	-----	No	-----	No
VOC	Ethylbenzene	T	100-41-4	207	12	5.80	1.00E+00		ug/L	Yes	-----	-----	-----	-----	530	0	0.00	No	No	-----	No
VOC	Hexachloroethane	T	67-72-1	35	0	0.00	3.30E+01	U	ug/L	Yes	-----	-----	-----	-----	10	0	0.00	-----	No	-----	No
VOC	m,p-Xylene	T		9	0	0.00	5.00E+00	U	ug/L	Yes	-----	-----	-----	-----	1400	0	0.00	-----	No	-----	No
VOC	o-Xylene	T	95-47-6	9	0	0.00	5.00E+00	U	ug/L	Yes	-----	-----	-----	-----	1400	0	0.00	-----	No	-----	No
VOC	Styrene	T	100-42-5	153	1	0.65	3.00E+00		ug/L	Yes	-----	-----	-----	-----	100	0	0.00	No	No	-----	No
VOC	Toluene	T	108-88-3	207	46	22.22	1.00E+01	J	ug/L	Yes	-----	-----	-----	-----	1000	0	0.00	No	No	-----	No
VOC	Total Xylenes	T	1330-20-7	153	19	12.42	4.10E+00		ug/L	Yes	-----	-----	-----	-----	1400	0	0.00	No	No	-----	No
VOC	trans-1,2-Dichloroethene	T	156-60-5	205	1	0.49	7.00E-01		ug/L	Yes	-----	-----	-----	-----	100	0	0.00	No	No	-----	No
VOC	trans-1,3-Dichloropropene	T	10061-02-6	207	0	0.00	1.00E+01	U	ug/L	Yes	-----	-----	-----	-----	1	0	0.00	-----	No	-----	No
MET	Silver	D		432	21	4.86	3.24E+01		ug/L	Yes	8.99E+00	1	2.31E-01	Yes	5	1	0.23	Yes	No	-----	No
MET	Copper	T	7440-50-8	960	918	95.63	2.59E+02		ug/L	Yes	2.23E+01	254	2.65E+01	Yes	200	3	0.31	Yes	No	-----	No

Table 5.4
Surface Water AOI Screening for Results From January 1, 2000 to July 31, 2005

Analyte Group	Analyte	Total or Dissolved	Derived CAS No.	Number of Samples	Number of Detections	Frequency of Detections (%)	Maximum Concentration	Data Qualifier	Unit	AOI Screen 1	AOI Screen 2				AOI Screen 3				AOI Screen 4	AOI Screen 5	Is Constituent an AOI ?
										Is There a Surface Water Standard ?	Background M2SD	Number of Detections Above the Background M2SD	Frequency of Detection (%) Above the Background M2SD	Is the Maximum Concentration Above the Background M2SD ?	Lowest Surface Water Standard or PQL	Number of Detections Above the Lowest Surface Water Standard or PQL	Frequency of Detection (%) Above the Surface Water Standard or PQL	Is the Maximum Result Above the Surface Water Standard or PQL ?	Is the Frequency of Detection Above the Surface Water Standard ≥ 1% ?	Is Constituent Eliminated or Retained By Process Knowledge ?	
MET	Mercury	T	7439-97-6	877	138	15.74	5.50E+00		ug/L	Yes	2.71E-01	34	3.88E+00	Yes	1	5	0.57	Yes	No	-----	No
RAD	Uranium-233/234	T		1916	1888	98.54	2.67E+01		pCi/L	Yes	1.97E+00	437	2.28E+01	Yes	10	11	0.57	Yes	No	-----	No
MET	Cadmium	T	7440-43-9	971	668	68.80	1.65E+01		ug/L	Yes	3.15E+00	26	2.68E+00	Yes	5	7	0.72	Yes	No	-----	No
MET	Arsenic	T	7440-38-2	960	781	81.35	1.47E+02		ug/L	Yes	1.24E+01	84	8.75E+00	Yes	50	8	0.83	Yes	No	-----	No
MET	Barium	T	7440-39-3	960	959	99.90	2.56E+03		ug/L	Yes	2.36E+02	256	2.67E+01	Yes	1000	8	0.83	Yes	No	-----	No
RAD	Tritium	T	10028-17-8	358	20	5.59	5.75E+02		pCi/L	Yes	4.39E+02	3	8.38E-01	Yes	500	3	0.84	Yes	No	-----	No
WQP	Fluoride	T	ConID 209	110	106	96.36	9.60E+03		ug/L	Yes	5.86E+02	4	3.64E+00	Yes	2000	1	0.91	Yes	No	-----	No
WQP	Sulfate	T	14808-79-8	110	109	99.09	3.50E+05		ug/L	Yes	4.27E+04	10	9.09E+00	Yes	250000	1	0.91	Yes	No	-----	No
VOC	Benzene	T	71-43-2	207	28	13.53	4.70E+00		ug/L	Yes	-----	-----	-----	-----	2.2	2	0.97	Yes	No	-----	No
MET	Nickel	T	7440-02-0	960	923	96.15	2.72E+02		ug/L	Yes	3.56E+01	61	6.35E+00	Yes	100	11	1.15	Yes	Yes	-----	Yes
RAD	Uranium-238	T	7440-61-1	1916	1893	98.80	3.08E+01		pCi/L	Yes	1.84E+00	430	2.24E+01	Yes	10	22	1.15	Yes	Yes	Eliminated	No
MET	Beryllium	T	7440-41-7	1309	887	67.76	2.55E+01		ug/L	Yes	2.49E+00	53	4.05E+00	Yes	5	16	1.22	Yes	Yes	-----	Yes
VOC	cis-1,2-Dichloroethene	T	156-59-2	151	25	16.56	2.10E+02		ug/L	Yes	-----	-----	-----	-----	70	2	1.32	Yes	Yes	-----	Yes
MET	Antimony	D		74	37	50.00	1.02E+01		ug/L	Yes	1.04E+02	0	0.00E+00	No	10	1	1.35	Yes	Yes	-----	No[1]
VOC	Vinyl Chloride	T	75-01-4	207	23	11.11	9.70E+00		ug/L	Yes	-----	-----	-----	-----	2	3	1.45	Yes	Yes	-----	Yes
MET	Zinc	T	7440-66-6	959	868	90.51	1.22E+04		ug/L	Yes	5.44E+02	127	1.32E+01	Yes	2000	21	2.19	Yes	Yes	Eliminated	No
VOC	Chloroform	T	67-66-3	207	56	27.05	1.20E+02	D	ug/L	Yes	-----	-----	-----	-----	3.4	6	2.90	Yes	Yes	-----	Yes
MET	Uranium	T		784	140	17.86	5.28E+01	B	pCi/L	Yes	7.89E+00	36	4.59E+00	Yes	10	27	3.44	Yes	Yes	Eliminated	No
VOC	Methylene Chloride	T	75-09-2	207	57	27.54	1.50E+01	BD	ug/L	Yes	-----	-----	-----	-----	4.6	8	3.86	Yes	Yes	-----	Yes
MET	Chromium	T	7440-47-3	1318	1178	89.38	3.48E+02		ug/L	Yes	5.64E+01	44	3.34E+00	Yes	50	52	3.95	Yes	Yes	-----	Yes
MET	Aluminum	D		73	34	46.58	1.33E+03		ug/L	Yes	4.30E+02	2	2.74E+00	Yes	87	3	4.11	Yes	Yes	-----	Yes
RAD	Uranium Isotopes	T		1788	1788	100.00	5.63E+01		pCi/L	Yes	7.89E+00	112	6.26E+00	Yes	10	75	4.19	Yes	Yes	-----	Yes
WQP	Chloride	T	16887-00-6	110	110	100.00	3.40E+05		ug/L	Yes	4.49E+04	50	4.55E+01	Yes	250000	5	4.55	Yes	Yes	Eliminated	No
VOC	Trichloroethene	T	79-01-6	207	28	13.53	6.60E+01		ug/L	Yes	-----	-----	-----	-----	2.5	10	4.83	Yes	Yes	-----	Yes
MET	Lead	T	7439-92-1	954	748	78.41	2.62E+02		ug/L	Yes	1.82E+01	173	1.81E+01	Yes	50	49	5.14	Yes	Yes	-----	Yes
VOC	Tetrachloroethene	T	127-18-4	204	26	12.75	4.40E+01		ug/L	Yes	-----	-----	-----	-----	1	12	5.88	Yes	Yes	-----	Yes
MET	Zinc	D		74	66	89.19	3.54E+02		ug/L	Yes	4.28E+02	0	0.00E+00	No	158.7	5	6.76	Yes	Yes	-----	No[a]
VOC	Carbon Tetrachloride	T	56-23-5	207	27	13.04	3.10E+02	D	ug/L	Yes	-----	-----	-----	-----	1	22	10.63	Yes	Yes	-----	Yes
MET	Antimony	T	7440-36-0	959	625	65.17	1.08E+02		ug/L	Yes	7.11E+01	3	3.13E-01	Yes	10	106	11.05	Yes	Yes	Eliminated	No[a]

Table 5.4
Surface Water AOI Screening for Results From January 1, 2000 to July 31, 2005

Analyte Group	Analyte	Total or Dissolved	Derived CAS No.	Number of Samples	Number of Detections	Frequency of Detections (%)	Maximum Concentration	Data Qualifier	Unit	AOI Screen 1	AOI Screen 2				AOI Screen 3				AOI Screen 4	AOI Screen 5	
										Is There a Surface Water Standard ?	Background M2SD	Number of Detections Above the Background M2SD	Frequency of Detection (%) Above the Background M2SD	Is the Maximum Concentration Above the Background M2SD ?	Lowest Surface Water Standard or PQL	Number of Detections Above the Lowest Surface Water Standard or PQL	Frequency of Detection (%) Above the Surface Water Standard or PQL	Is the Maximum Result Above the Surface Water Standard or PQL ?	Is the Frequency of Detection Above the Surface Water Standard ≥ 1% ?	Is Constituent Eliminated or Retained By Process Knowledge ?	Is Constituent an AOI ?
MET	Iron	D	7439-89-6	74	53	71.62	4.60E+04		ug/L	Yes	1.31E+04	1	1.35E+00	Yes	300	11	14.86	Yes	Yes	Eliminated	No
RAD	Gross Alpha	T	12587-47-2	32	13	40.63	5.21E+02		pCi/L	Yes	1.83E+01	3	9.38E+00	Yes	7	5	15.63	Yes	Yes	-----	Yes
WQP	Nitrate/Nitrite (as N)	T	ConID 184	636	603	94.81	1.20E+06		ug/L	Yes	3.48E+03	270	4.25E+01	Yes	10000	104	16.35	Yes	Yes	-----	Yes
RAD	Americium-241	T	86954-36-1	2078	881	42.40	8.40E+01		pCi/L	Yes	2.33E-02	821	3.95E+01	Yes	0.15	353	16.99	Yes	Yes	-----	Yes
RAD	Gross Beta	T	12587-46-1	32	24	75.00	3.98E+02		pCi/L	Yes	1.50E+01	3	9.38E+00	Yes	8	6	18.75	Yes	Yes	-----	Yes
WQP	Ammonia (as N)	T	ConID 170	285	204	71.58	4.40E+03		ug/L	Yes	-----	-----	-----	-----	500	54	18.95	Yes	Yes	Eliminated	No
RAD	Plutonium-239/240	T		2110	1015	48.10	2.59E+02		pCi/L	Yes	1.87E-02	981	4.65E+01	Yes	0.15	434	20.57	Yes	Yes	-----	Yes
MET	Manganese	T	7439-96-5	960	956	99.58	4.47E+03		ug/L	Yes	7.58E+02	109	1.14E+01	Yes	200	338	35.21	Yes	Yes	Eliminated	No
WQP	Cyanide	T	57-12-5	2	2	100.00	3.65E+01		ug/L	Yes	9.35E+02	0	0.00E+00	No	5	1	50.00	Yes	Yes	-----	No[a]
MET	Manganese	D		74	64	86.49	1.40E+03		ug/L	Yes	3.78E+02	11	1.49E+01	Yes	50	38	51.35	Yes	Yes	Eliminated	No
MET	Iron	T	7439-89-6	960	953	99.27	3.98E+05		ug/L	Yes	2.35E+04	128	1.33E+01	Yes	1000	717	74.69	Yes	Yes	Eliminated	No

----- Not Applicable

The frequency of detection of the analyte concentration above the lowest surface water standard or PQL, whichever is higher, is greater than 0 percent and less than 1 percent.

The frequency of detection of the analyte concentration above the lowest surface water standard or PQL, whichever is higher, is greater than or equal to 1 percent and less than 5 percent.

The frequency of detection of the analyte concentration above the lowest surface water standard or PQL, whichever is higher, is greater than 5 percent.

[a]Although dissolved antimony, dissolved zinc, and cyanide have a frequency of detection above 1 percent, they were not retained as an AOI because their maximum result was less than the background M2SD.

The results presented in this table are ordered by increasing frequency of detection above the surface water standard.

Table 5.5
Surface Water AOIs Eliminated or Retained Based on Process Knowledge

Analyte	Basis for Eliminating Constituent as a Surface Water AOI
Antimony	Total antimony was eliminated as an AOI because none of the most recent surface water results exceeded the surface water standard (see Figure A1.99).
Iron	Dissolved iron was not retained as an AOI because it only occurs above the surface water standard at the former Present Landfill seep which has been remediated. Total iron was not retained as an AOI because it is a ubiquitous, naturally occurring constituent of the particulates that comprise the total iron analysis. Iron commonly occurs as a chemical component of the particulate, suspended ferric oxyhydroxides, and as coatings on particulates. Based on results of different exposure scenarios, iron was not carried forward as a material of concern for the ChemRisk process (K-H 2005a).
Manganese	Manganese was eliminated as an AOI based on process knowledge that it was not identified or discussed in building process information (CDH 1992; K-H 2005a). Manganese has not been found associated with UBC Sites (DOE 2004a). Only small quantities were identified to be in inventory with the exception of manganous sulfate which had an inventory in 1974 of 2,560 kg and then later in 1988 of 0.06 kg (the specific use was not clear in the ChemRisk reports). Based on results of different exposure scenarios, manganese was not carried forward as a material of concern for the ChemRisk process (K-H 2005a).
Zinc	Total zinc was eliminated as an AOI because none of the most recent surface water results exceeded the surface water standard (see Figure A1.134).
Uranium	Although uranium (as a metal) has a frequency of detection above 1 percent, it was not retained as an AOI. Total uranium isotopes, which is the sum of the individual uranium-233, -234, -235, and -238, was retained as the uranium AOI instead.
Uranium-238	Although uranium-238 has a frequency of detection above 1 percent, it was not retained as an AOI because there is not a surface water standard for individual uranium isotopes. Total uranium isotopes, which is the sum of the individual uranium-233, -234, -235, and –238, was retained as the uranium AOI instead.
Chloride	Although chloride has a frequency of detection above 1 percent, it was not retained as an AOI because the primary source of chloride at RFETS was salt used as a deicer on roads during the winter.
Ammonia (as N)	Although ammonia (as N) has a frequency of detection above 1 percent, it was not retained as an AOI because its only occurrence is at the Present Landfill seep. A final remedial action has been taken at the Present Landfill.

Table 5.6
Surface Water AOIs for Results From January 1, 2000 to Present

Analyte Group	Analyte	Total or Dissolved	Derived CAS No.	Number of Samples	Number of Detections	Frequency of Detections (%)	Maximum Concentration	Data Qualifier	Unit	AOI Screen 1	AOI Screen 2				AOI Screen 3				AOI Screen 4	AOI Screen 5	Is Constituent an AOI ?
										Is There a Surface Water Standard ?	Background M2SD	Number of Detections Above the Background M2SD	Frequency of Detection (%) Above the Background M2SD	Is the Maximum Concentration Above the Background M2SD ?	Lowest Surface Water Standard or PQL	Number of Detections Above the Lowest Surface Water Standard or PQL	Frequency of Detection (%) Above the Surface Water Standard or PQL	Is the Maximum Result Above the Surface Water Standard or PQL ?	Is the Frequency of Detection Above the Surface Water Standard ≥ 1% ?	Is Constituent Eliminated or Retained By Process Knowledge ?	
MET	Nickel	T	7440-02-0	960	923	96.15	2.72E+02		ug/L	Yes	3.56E+01	61	6.35	Yes	100	11	1.15	Yes	Yes	-----	Yes
MET	Beryllium	T	7440-41-7	1309	887	67.76	2.55E+01		ug/L	Yes	2.49E+00	53	4.05	Yes	5	16	1.22	Yes	Yes	-----	Yes
VOC	cis-1,2-Dichloroethene	T	156-59-2	151	25	16.56	2.10E+02		ug/L	Yes	-----	-----	-----	-----	70	2	1.32	Yes	Yes	-----	Yes
VOC	Vinyl Chloride	T	75-01-4	207	23	11.11	9.70E+00		ug/L	Yes	-----	-----	-----	-----	2	3	1.45	Yes	Yes	-----	Yes
VOC	Chloroform	T	67-66-3	207	56	27.05	1.20E+02	D	ug/L	Yes	-----	-----	-----	-----	3.4	6	2.90	Yes	Yes	-----	Yes
VOC	Methylene Chloride	T	75-09-2	207	57	27.54	1.50E+01	BD	ug/L	Yes	-----	-----	-----	-----	4.6	8	3.86	Yes	Yes	-----	Yes
MET	Chromium	T	7440-47-3	1318	1178	89.38	3.48E+02		ug/L	Yes	5.64E+01	44	3.34	Yes	50	52	3.95	Yes	Yes	-----	Yes
MET	Aluminum	D		73	34	46.58	1.33E+03		ug/L	Yes	4.30E+02	2	2.74	Yes	87	3	4.11	Yes	Yes	-----	Yes
RAD	Uranium Isotopes	T		1788	1788	100.00	5.63E+01		pCi/L	Yes	7.89E+00	112	6.26	Yes	10	75	4.19	Yes	Yes	-----	Yes
VOC	Trichloroethene	T	79-01-6	207	28	13.53	6.60E+01		ug/L	Yes	-----	-----	-----	-----	2.5	10	4.83	Yes	Yes	-----	Yes
MET	Lead	T	7439-92-1	954	748	78.41	2.62E+02		ug/L	Yes	1.82E+01	173	18.13	Yes	50	49	5.14	Yes	Yes	-----	Yes
VOC	Tetrachloroethene	T	127-18-4	204	26	12.75	4.40E+01		ug/L	Yes	-----	-----	-----	-----	1	12	5.88	Yes	Yes	-----	Yes
VOC	Carbon Tetrachloride	T	56-23-5	207	27	13.04	3.10E+02	D	ug/L	Yes	-----	-----	-----	-----	1	22	10.63	Yes	Yes	-----	Yes
RAD	Gross Alpha	T	12587-47-2	32	13	40.63	5.21E+02		pCi/L	Yes	1.83E+01	3	9.38	Yes	7	5	15.63	Yes	Yes	-----	Yes
WQP	Nitrate/Nitrite (as N)	T	ConID 184	636	603	94.81	1.20E+06		ug/L	Yes	3.48E+03	270	42.45	Yes	10000	104	16.35	Yes	Yes	-----	Yes
RAD	Americium-241	T	86954-36-1	2078	881	42.40	8.40E+01		pCi/L	Yes	2.33E-02	821	39.51	Yes	0.15	353	16.99	Yes	Yes	-----	Yes
RAD	Gross Beta	T	12587-46-1	32	24	75.00	3.98E+02		pCi/L	Yes	1.50E+01	3	9.38	Yes	8	6	18.75	Yes	Yes	-----	Yes
RAD	Plutonium-239/240	T		2110	1015	48.10	2.59E+02		pCi/L	Yes	1.87E-02	981	46.49	Yes	0.15	434	20.57	Yes	Yes	-----	Yes

----- Not Applicable

The frequency of detection of the analyte concentration above the lowest surface water standard or PQL, whichever is higher, is greater than or equal to 1 percent and less than 5 percent.

The frequency of detection of the analyte concentration above the lowest surface water standard or PQL, whichever is higher, is greater than 5 percent.

The results presented in this table are ordered by increasing frequency of detection above the surface water standard.

Table 5.7
Summary of Surface Water AOIs by Drainage Basin

Drainage Basin	Surface Water AOI
Walnut Creek	Carbon Tetrachloride
Walnut Creek	Chloroform
Walnut Creek	cis-1,2-Dichloroethene
Walnut Creek	Methylene Chloride
Walnut Creek	Tetrachloroethene
Walnut Creek, Woman Creek	Trichloroethene
Walnut Creek	Vinyl Chloride
Walnut Creek	Dissolved Aluminum
Walnut Creek, Woman Creek	Total Beryllium
Walnut Creek, Woman Creek	Total Chromium
Walnut Creek, Woman Creek	Total Lead
Walnut Creek	Total Nickel
Walnut Creek, Woman Creek	Total Americium-241
Walnut Creek	Total Gross Alpha
Walnut Creek	Total Gross Beta
Walnut Creek, Woman Creek, Rock Creek	Total Plutonium-239/240
Walnut Creek, Woman Creek	Total Uranium Isotopes
Walnut Creek	Nitrate/Nitrite (as N)

Table 5.8
Sediment AOI Screening

Analyte Group	Analyte	Derived CAS No.	Number of Samples	Number of Detections	Frequency of Detection (%)	Maximum Concentration	Data Qualifier	Units	AOI Screen 1	AOI Screen 2				AOI Screen 3				AOI Screen 4	Is Constituent an AOI ?
									Is There a WRW PRG ?	Background M2SD	Number of Detections Above the Background M2SD	Frequency of Detection (%) Above the Background M2SD	Is the Maximum Concentration Above the Background M2SD ?	WRW PRG	Number of Detections Above the WRW PRG	Frequency of Detection (%) Above the WRW PRG	Is the Maximum Result Above the WRW PRG ?	Is Constituent Eliminated or Retained By Process Knowledge ?	
DIOXINS	123478-HxCDD	39227-28-6	6	1	16.67	1.26E-03	J	ug/kg	Yes	-----	-----	-----	---	4.83E-01	0	0.00	---	-----	No
DIOXINS	123678-HxCDD	57653-85-7	6	2	33.33	4.55E-03		ug/kg	Yes	-----	-----	-----	---	4.83E-01	0	0.00	---	-----	No
DIOXINS	123789-HxCDD	19408-74-3	6	2	33.33	3.29E-03		ug/kg	Yes	-----	-----	-----	---	4.83E-01	0	0.00	---	-----	No
DIOXINS	2378-TCDD	1746-01-6	6	1	16.67	2.78E-03		ug/kg	Yes	-----	-----	-----	---	2.48E-02	0	0.00	---	-----	No
HERB	2,4,5-T	93-76-5	1	0	0.00	6.00E+01	U	ug/kg	Yes	-----	-----	-----	---	8.01E+05	0	0.00	---	-----	No
HERB	2,4,5-TP (Silvex)	93-72-1	1	0	0.00	6.00E+01	U	ug/kg	Yes	-----	-----	-----	---	1.69E+05	0	0.00	---	-----	No
HERB	2,4-D	94-75-7	1	0	0.00	1.80E+02	U	ug/kg	Yes	-----	-----	-----	---	8.01E+05	0	0.00	---	-----	No
HERB	2,4-DB	94-82-6	1	0	0.00	1.40E+03	U	ug/kg	Yes	-----	-----	-----	---	6.41E+05	0	0.00	---	-----	No
HERB	4-Nitrophenol	100-02-7	289	1	0.35	1.30E+03	J	ug/kg	Yes	-----	-----	-----	---	6.41E+05	0	0.00	---	-----	No
HERB	Dalapon	75-99-0	1	0	0.00	2.30E+03	U	ug/kg	Yes	-----	-----	-----	---	2.40E+06	0	0.00	---	-----	No
HERB	Dicamba	1918-00-9	1	0	0.00	9.60E+01	U	ug/kg	Yes	-----	-----	-----	---	2.40E+06	0	0.00	---	-----	No
HERB	Dinoseb	88-85-7	1	0	0.00	8.40E+01	U	ug/kg	Yes	-----	-----	-----	---	8.01E+04	0	0.00	---	-----	No
HERB	MCPA	94-74-6	1	0	0.00	9.40E+04	U	ug/kg	Yes	-----	-----	-----	---	4.01E+04	0	0.00	---	-----	No
HERB	MCPP	93-65-2	1	0	0.00	1.40E+05	U	ug/kg	Yes	-----	-----	-----	---	8.01E+04	0	0.00	---	-----	No
METAL	Barium	7440-39-3	386	385	99.74	4.04E+05		ug/kg	Yes	1.97E+05	47	12.18	Yes	2.87E+06	0	0.00	---	-----	No
METAL	Beryllium	7440-41-7	380	273	71.84	6.70E+03		ug/kg	Yes	1.47E+03	18	4.74	Yes	1.00E+05	0	0.00	---	-----	No
METAL	Boron	7440-42-8	106	103	97.17	3.00E+04		ug/kg	Yes	-----	-----	-----	---	9.48E+06	0	0.00	---	-----	No
METAL	Cadmium	7440-43-9	377	155	41.11	4.40E+04		ug/kg	Yes	1.21E+03	40	10.61	Yes	9.14E+04	0	0.00	---	-----	No
METAL	Chromium VI	18540-29-9	42	14	33.33	1.30E+01		ug/kg	Yes	-----	-----	-----	---	2.84E+04	0	0.00	---	-----	No
METAL	Cobalt	7440-48-4	384	360	93.75	2.01E+04		ug/kg	Yes	1.26E+04	16	4.17	Yes	1.22E+05	0	0.00	---	-----	No
METAL	Copper	7440-50-8	386	370	95.85	3.24E+05		ug/kg	Yes	2.76E+04	42	10.88	Yes	4.44E+06	0	0.00	---	-----	No
METAL	Lead	7439-92-1	386	386	100.00	2.34E+05	*	ug/kg	Yes	3.81E+04	46	11.92	Yes	1.00E+06	0	0.00	---	-----	No
METAL	Lithium	7439-93-2	379	321	84.70	3.70E+04		ug/kg	Yes	2.05E+04	13	3.43	Yes	2.22E+06	0	0.00	---	-----	No
METAL	Mercury	7439-97-6	353	129	36.54	3.80E+03		ug/kg	Yes	2.00E+02	17	4.82	Yes	3.29E+04	0	0.00	---	-----	No
METAL	Molybdenum	7439-98-7	378	139	36.77	1.17E+04		ug/kg	Yes	1.68E+04	0	0.00	---	5.55E+05	0	0.00	---	-----	No
METAL	Nickel	7440-02-0	385	354	91.95	2.16E+05		ug/kg	Yes	1.76E+04	104	27.01	Yes	2.22E+06	0	0.00	---	-----	No
METAL	Selenium	7782-49-2	375	91	24.27	3.80E+03	B	ug/kg	Yes	1.73E+03	14	3.73	Yes	5.55E+05	0	0.00	---	-----	No
METAL	Strontium	7440-24-6	383	382	99.74	5.26E+05		ug/kg	Yes	1.51E+05	8	2.09	Yes	6.67E+07	0	0.00	---	-----	No
METAL	Tin	7440-31-5	377	65	17.24	7.72E+04		ug/kg	Yes	7.09E+04	1	0.27	Yes	6.67E+07	0	0.00	---	-----	No
METAL	Titanium	7440-32-6	106	106	100.00	3.30E+05		ug/kg	Yes	-----	-----	-----	---	1.70E+08	0	0.00	---	-----	No

Table 5.8
Sediment AOI Screening

Analyte Group	Analyte	Derived CAS No.	Number of Samples	Number of Detections	Frequency of Detection (%)	Maximum Concentration	Data Qualifier	Units	AOI Screen 1	AOI Screen 2				AOI Screen 3				AOI Screen 4	Is Constituent an AOI ?
									Is There a WRW PRG ?	Background M2SD	Number of Detections Above the Background M2SD	Frequency of Detection (%) Above the Background M2SD	Is the Maximum Concentration Above the Background M2SD ?	WRW PRG	Number of Detections Above the WRW PRG	Frequency of Detection (%) Above the WRW PRG	Is the Maximum Result Above the WRW PRG ?	Is Constituent Eliminated or Retained By Process Knowledge ?	
METAL	Uranium	11-09-6	135	8	5.93	1.37E+01		pCi/g	Yes	-----	-----	-----	---	2.28E+02	0	0.00	---	-----	No
METAL	Vanadium	7440-62-2	386	378	97.93	9.60E+04		ug/kg	Yes	5.13E+04	26	6.74	Yes	1.11E+05	0	0.00	---	-----	No
METAL	Zinc	7440-66-6	386	385	99.74	2.08E+06	*	ug/kg	Yes	3.30E+05	29	7.51	Yes	3.33E+07	0	0.00	---	-----	No
PCB	PCB-1016	12674-11-2	313	0	0.00	9.90E+02	U	ug/kg	Yes	-----	-----	-----	---	1.35E+03	0	0.00	---	-----	No
PCB	PCB-1221	11104-28-2	313	0	0.00	9.90E+02	U	ug/kg	Yes	-----	-----	-----	---	1.35E+03	0	0.00	---	-----	No
PCB	PCB-1232	11141-16-5	313	0	0.00	9.90E+02	U	ug/kg	Yes	-----	-----	-----	---	1.35E+03	0	0.00	---	-----	No
PCB	PCB-1242	53469-21-9	313	0	0.00	9.90E+02	U	ug/kg	Yes	-----	-----	-----	---	1.35E+03	0	0.00	---	-----	No
PCB	PCB-1248	12672-29-6	313	0	0.00	9.90E+02	U	ug/kg	Yes	-----	-----	-----	---	1.35E+03	0	0.00	---	-----	No
PEST	4,4'-DDD	72-54-8	231	0	0.00	2.00E+02	U	ug/kg	Yes	-----	-----	-----	---	1.55E+04	0	0.00	---	-----	No
PEST	4,4'-DDE	72-55-9	231	1	0.43	4.10E+00	J	ug/kg	Yes	-----	-----	-----	---	1.10E+04	0	0.00	---	-----	No
PEST	4,4'-DDT	50-29-3	231	5	2.16	1.80E+01	J	ug/kg	Yes	-----	-----	-----	---	1.09E+04	0	0.00	---	-----	No
PEST	Aldrin	309-00-2	229	3	1.31	5.40E+01		ug/kg	Yes	-----	-----	-----	---	1.76E+02	0	0.00	---	-----	No
PEST	alpha-BHC	319-84-6	231	0	0.00	9.90E+01	U	ug/kg	Yes	-----	-----	-----	---	5.70E+02	0	0.00	---	-----	No
PEST	alpha-Chlordane	5103-71-9	229	2	0.87	0.00E+00	I	ug/kg	Yes	-----	-----	-----	---	1.03E+04	0	0.00	---	-----	No
PEST	Atrazine	1912-24-9	5	1	20.00	1.20E+02		ug/kg	Yes	-----	-----	-----	---	1.36E+04	0	0.00	---	-----	No
PEST	beta-BHC	319-85-7	231	3	1.30	2.80E+01		ug/kg	Yes	-----	-----	-----	---	1.99E+03	0	0.00	---	-----	No
PEST	beta-Chlordane	5103-74-2	157	0	0.00	4.00E+02	U	ug/kg	Yes	-----	-----	-----	---	1.03E+04	0	0.00	---	-----	No
PEST	Chlordane		2	0	0.00	9.40E+01	U	ug/kg	Yes	-----	-----	-----	---	1.03E+04	0	0.00	---	-----	No
PEST	delta-BHC	319-86-8	231	3	1.30	1.30E+01		ug/kg	Yes	-----	-----	-----	---	5.70E+02	0	0.00	---	-----	No
PEST	Dieldrin	60-57-1	231	1	0.43	4.60E+00	J	ug/kg	Yes	-----	-----	-----	---	1.87E+02	0	0.00	---	-----	No
PEST	Endosulfan I	959-98-8	231	3	1.30	2.00E+01	J	ug/kg	Yes	-----	-----	-----	---	4.81E+05	0	0.00	---	-----	No
PEST	Endosulfan II	33213-65-9	231	0	0.00	2.00E+02	U	ug/kg	Yes	-----	-----	-----	---	4.81E+05	0	0.00	---	-----	No
PEST	Endosulfan sulfate	1031-07-8	231	0	0.00	2.00E+02	U	ug/kg	Yes	-----	-----	-----	---	4.81E+05	0	0.00	---	-----	No
PEST	Endrin	72-20-8	231	0	0.00	2.00E+02	U	ug/kg	Yes	-----	-----	-----	---	2.40E+04	0	0.00	---	-----	No
PEST	Endrin aldehyde	7421-93-4	53	0	0.00	2.70E+01	U	ug/kg	Yes	-----	-----	-----	---	2.40E+04	0	0.00	---	-----	No
PEST	Endrin ketone	53494-70-5	221	0	0.00	2.00E+02	U	ug/kg	Yes	-----	-----	-----	---	3.33E+04	0	0.00	---	-----	No
PEST	gamma-BHC (Lindane)	58-89-9	230	2	0.87	2.50E+01		ug/kg	Yes	-----	-----	-----	---	2.77E+03	0	0.00	---	-----	No
PEST	gamma-Chlordane	12789-03-6	72	2	2.78	0.00E+00	I	ug/kg	Yes	-----	-----	-----	---	1.03E+04	0	0.00	---	-----	No
PEST	Heptachlor	76-44-8	231	3	1.30	3.10E+00	J	ug/kg	Yes	-----	-----	-----	---	6.65E+02	0	0.00	---	-----	No
PEST	Heptachlor epoxide	1024-57-3	231	3	1.30	3.30E+01		ug/kg	Yes	-----	-----	-----	---	3.29E+02	0	0.00	---	-----	No

Table 5.8
Sediment AOI Screening

Analyte Group	Analyte	Derived CAS No.	Number of Samples	Number of Detections	Frequency of Detection (%)	Maximum Concentration	Data Qualifier	Units	AOI Screen 1	AOI Screen 2				AOI Screen 3				AOI Screen 4	Is Constituent an AOI ?
									Is There a WRW PRG ?	Background M2SD	Number of Detections Above the Background M2SD	Frequency of Detection (%) Above the Background M2SD	Is the Maximum Concentration Above the Background M2SD ?	WRW PRG	Number of Detections Above the WRW PRG	Frequency of Detection (%) Above the WRW PRG	Is the Maximum Result Above the WRW PRG ?	Is Constituent Eliminated or Retained By Process Knowledge ?	
PEST	Hexachlorocyclopentadiene	77-47-4	283	0	0.00	3.60E+03	U	ug/kg	Yes	-----	-----	-----	---	3.80E+05	0	0.00	---	-----	No
PEST	Methoxychlor	72-43-5	231	1	0.43	2.70E+00	J	ug/kg	Yes	-----	-----	-----	---	4.01E+05	0	0.00	---	-----	No
PEST	Simazine	122-34-9	4	0	0.00	5.00E+01	U	ug/kg	Yes	-----	-----	-----	---	2.50E+04	0	0.00	---	-----	No
PEST	Toxaphene	8001-35-2	231	0	0.00	2.30E+03	U	ug/kg	Yes	-----	-----	-----	---	2.72E+03	0	0.00	---	-----	No
RAD	Strontium-89/90		200	149	74.50	4.86E+00		pCi/g	Yes	5.76E-01	23	11.50	Yes	1.32E+01	0	0.00	---	-----	No
RAD	Uranium Isotopes		387	387	100.00	6.97E+01		pCi/g	Yes	-----	-----	-----	---	2.28E+02	0	0.00	---	-----	No
RAD	Uranium-233/234		423	422	99.76	1.50E+01		pCi/g	Yes	3.92E+00	7	1.65	Yes	2.53E+01	0	0.00	---	-----	No
RAD	Uranium-235	15117-96-1	423	249	58.87	8.52E-01		pCi/g	Yes	1.52E-01	22	5.20	Yes	1.05E+00	0	0.00	---	-----	No
SVOC	1,2,4-Trichlorobenzene	120-82-1	313	1	0.32	2.00E+00	J	ug/kg	Yes	-----	-----	-----	---	1.51E+05	0	0.00	---	-----	No
SVOC	2,4,5-Trichlorophenol	95-95-4	292	0	0.00	1.00E+04	U	ug/kg	Yes	-----	-----	-----	---	8.01E+06	0	0.00	---	-----	No
SVOC	2,4,6-Trichlorophenol	88-06-2	292	0	0.00	3.60E+03	U	ug/kg	Yes	-----	-----	-----	---	2.72E+05	0	0.00	---	-----	No
SVOC	2,4-Dichlorophenol	120-83-2	291	0	0.00	3.60E+03	U	ug/kg	Yes	-----	-----	-----	---	2.40E+05	0	0.00	---	-----	No
SVOC	2,4-Dimethylphenol	105-67-9	291	0	0.00	3.60E+03	U	ug/kg	Yes	-----	-----	-----	---	1.60E+06	0	0.00	---	-----	No
SVOC	2,4-Dinitrophenol	51-28-5	274	1	0.36	8.90E+02	J	ug/kg	Yes	-----	-----	-----	---	1.60E+05	0	0.00	---	-----	No
SVOC	2,4-Dinitrotoluene	121-14-2	292	0	0.00	3.60E+03	U	ug/kg	Yes	-----	-----	-----	---	1.60E+05	0	0.00	---	-----	No
SVOC	2,6-Dinitrotoluene	606-20-2	291	0	0.00	3.60E+03	U	ug/kg	Yes	-----	-----	-----	---	8.01E+04	0	0.00	---	-----	No
SVOC	2-Chloronaphthalene	91-58-7	291	0	0.00	3.60E+03	U	ug/kg	Yes	-----	-----	-----	---	6.41E+06	0	0.00	---	-----	No
SVOC	2-Chlorophenol	95-57-8	291	0	0.00	3.60E+03	U	ug/kg	Yes	-----	-----	-----	---	5.55E+05	0	0.00	---	-----	No
SVOC	2-Methylnaphthalene	91-57-6	291	9	3.09	2.00E+03		ug/kg	Yes	-----	-----	-----	---	3.21E+05	0	0.00	---	-----	No
SVOC	2-Methylphenol	95-48-7	292	1	0.34	2.00E+02	J	ug/kg	Yes	-----	-----	-----	---	4.01E+06	0	0.00	---	-----	No
SVOC	2-Nitroaniline	88-74-4	291	0	0.00	1.80E+04	U	ug/kg	Yes	-----	-----	-----	---	1.92E+05	0	0.00	---	-----	No
SVOC	3,3'-Dichlorobenzidine	91-94-1	283	0	0.00	7.10E+03	U	ug/kg	Yes	-----	-----	-----	---	6.67E+03	0	0.00	---	-----	No
SVOC	4,6-Dinitro-2-methylphenol	534-52-1	280	2	0.71	1.10E+03	J	ug/kg	Yes	-----	-----	-----	---	8.01E+03	0	0.00	---	-----	No
SVOC	4-Chloroaniline	106-47-8	284	0	0.00	7.10E+03	U	ug/kg	Yes	-----	-----	-----	---	3.21E+05	0	0.00	---	-----	No
SVOC	4-Methylphenol	106-44-5	293	9	3.07	1.50E+03	J	ug/kg	Yes	-----	-----	-----	---	4.01E+05	0	0.00	---	-----	No
SVOC	4-Nitroaniline	100-01-6	283	0	0.00	1.80E+04	U	ug/kg	Yes	-----	-----	-----	---	2.08E+05	0	0.00	---	-----	No
SVOC	Acenaphthene	83-32-9	291	41	14.09	6.20E+02		ug/kg	Yes	-----	-----	-----	---	4.44E+06	0	0.00	---	-----	No
SVOC	Anthracene	120-12-7	291	76	26.12	9.70E+02		ug/kg	Yes	-----	-----	-----	---	2.22E+07	0	0.00	---	-----	No
SVOC	Benzo(a)anthracene	56-55-3	291	126	43.30	1.40E+03		ug/kg	Yes	-----	-----	-----	---	3.79E+03	0	0.00	---	-----	No
SVOC	Benzo(b)fluoranthene	205-99-2	290	111	38.28	1.50E+03		ug/kg	Yes	-----	-----	-----	---	3.79E+03	0	0.00	---	-----	No

Table 5.8
Sediment AOI Screening

Analyte Group	Analyte	Derived CAS No.	Number of Samples	Number of Detections	Frequency of Detection (%)	Maximum Concentration	Data Qualifier	Units	AOI Screen 1	AOI Screen 2				AOI Screen 3				AOI Screen 4	
									Is There a WRW PRG ?	Background M2SD	Number of Detections Above the Background M2SD	Frequency of Detection (%) Above the Background M2SD	Is the Maximum Concentration Above the Background M2SD ?	WRW PRG	Number of Detections Above the WRW PRG	Frequency of Detection (%) Above the WRW PRG	Is the Maximum Result Above the WRW PRG ?	Is Constituent Eliminated or Retained By Process Knowledge ?	Is Constituent an AOI ?
SVOC	Benzo(k)fluoranthene	207-08-9	290	85	29.31	1.20E+03	J	ug/kg	Yes	-----	-----	-----	---	3.79E+04	0	0.00	---	-----	No
SVOC	Benzoic Acid	65-85-0	237	30	12.66	2.70E+03	J	ug/kg	Yes	-----	-----	-----	---	3.21E+08	0	0.00	---	-----	No
SVOC	Benzyl Alcohol	100-51-6	241	1	0.41	4.10E+01	J	ug/kg	Yes	-----	-----	-----	---	2.40E+07	0	0.00	---	-----	No
SVOC	bis(2-Chloroethyl) ether	111-44-4	291	0	0.00	3.60E+03	U	ug/kg	Yes	-----	-----	-----	---	3.77E+03	0	0.00	---	-----	No
SVOC	bis(2-Chloroisopropyl) ether	108-60-1	288	0	0.00	3.60E+03	U	ug/kg	Yes	-----	-----	-----	---	5.93E+04	0	0.00	---	-----	No
SVOC	bis(2-ethylhexyl)phthalate	117-81-7	291	153	52.58	4.70E+04		ug/kg	Yes	-----	-----	-----	---	2.14E+05	0	0.00	---	-----	No
SVOC	Butylbenzylphthalate	85-68-7	291	16	5.50	1.70E+03		ug/kg	Yes	-----	-----	-----	---	1.60E+07	0	0.00	---	-----	No
SVOC	Carbazole	86-74-8	50	19	38.00	3.00E+02	J	ug/kg	Yes	-----	-----	-----	---	1.50E+05	0	0.00	---	-----	No
SVOC	Chrysene	218-01-9	292	142	48.63	1.50E+03		ug/kg	Yes	-----	-----	-----	---	3.79E+05	0	0.00	---	-----	No
SVOC	Dibenzofuran	132-64-9	291	11	3.78	3.00E+02	J	ug/kg	Yes	-----	-----	-----	---	2.22E+05	0	0.00	---	-----	No
SVOC	Diethylphthalate	84-66-2	292	3	1.03	7.90E+01	J	ug/kg	Yes	-----	-----	-----	---	6.41E+07	0	0.00	---	-----	No
SVOC	Dimethylphthalate	131-11-3	291	4	1.37	4.90E+02	J	ug/kg	Yes	-----	-----	-----	---	8.01E+08	0	0.00	---	-----	No
SVOC	Di-n-butylphthalate	84-74-2	292	68	23.29	3.90E+02	J	ug/kg	Yes	-----	-----	-----	---	8.01E+06	0	0.00	---	-----	No
SVOC	Di-n-octylphthalate	117-84-0	291	23	7.90	9.80E+03		ug/kg	Yes	-----	-----	-----	---	3.21E+06	0	0.00	---	-----	No
SVOC	Fluoranthene	206-44-0	292	160	54.79	3.10E+03		ug/kg	Yes	-----	-----	-----	---	2.96E+06	0	0.00	---	-----	No
SVOC	Fluorene	86-73-7	291	28	9.62	6.50E+02		ug/kg	Yes	-----	-----	-----	---	3.21E+06	0	0.00	---	-----	No
SVOC	Hexachlorobenzene	118-74-1	292	0	0.00	3.60E+03	U	ug/kg	Yes	-----	-----	-----	---	1.87E+03	0	0.00	---	-----	No
SVOC	Hexachlorobutadiene	87-68-3	313	1	0.32	2.00E+00	J	ug/kg	Yes	-----	-----	-----	---	2.22E+04	0	0.00	---	-----	No
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	288	80	27.78	9.10E+02		ug/kg	Yes	-----	-----	-----	---	3.79E+03	0	0.00	---	-----	No
SVOC	Isophorone	78-59-1	291	0	0.00	3.60E+03	U	ug/kg	Yes	-----	-----	-----	---	3.16E+06	0	0.00	---	-----	No
SVOC	Naphthalene	91-20-3	313	20	6.39	3.20E+02	J	ug/kg	Yes	-----	-----	-----	---	1.40E+06	0	0.00	---	-----	No
SVOC	Nitrobenzene	98-95-3	292	0	0.00	3.60E+03	U	ug/kg	Yes	-----	-----	-----	---	4.32E+04	0	0.00	---	-----	No
SVOC	N-Nitroso-di-n-propylamine	621-64-7	291	0	0.00	3.60E+03	U	ug/kg	Yes	-----	-----	-----	---	4.29E+02	0	0.00	---	-----	No
SVOC	n-Nitrosodiphenylamine	86-30-6	291	0	0.00	3.60E+03	U	ug/kg	Yes	-----	-----	-----	---	6.12E+05	0	0.00	---	-----	No
SVOC	Pentachlorophenol	87-86-5	292	6	2.05	1.50E+03	J	ug/kg	Yes	-----	-----	-----	---	1.76E+04	0	0.00	---	-----	No
SVOC	Phenol	108-95-2	291	5	1.72	1.50E+02	J	ug/kg	Yes	-----	-----	-----	---	2.40E+07	0	0.00	---	-----	No
SVOC	Pyrene	129-00-0	292	139	47.60	3.90E+03		ug/kg	Yes	-----	-----	-----	---	2.22E+06	0	0.00	---	-----	No
VOC	1,1,1,2-Tetrachloroethane	630-20-6	49	0	0.00	2.30E+01	U	ug/kg	Yes	-----	-----	-----	---	9.10E+04	0	0.00	---	-----	No
VOC	1,1,1-Trichloroethane	71-55-6	248	1	0.40	9.00E+00	J	ug/kg	Yes	-----	-----	-----	---	9.18E+06	0	0.00	---	-----	No
VOC	1,1,2,2-Tetrachloroethane	79-34-5	247	1	0.40	2.00E+00	J	ug/kg	Yes	-----	-----	-----	---	1.05E+04	0	0.00	---	-----	No

Table 5.8
Sediment AOI Screening

Analyte Group	Analyte	Derived CAS No.	Number of Samples	Number of Detections	Frequency of Detection (%)	Maximum Concentration	Data Qualifier	Units	AOI Screen 1	AOI Screen 2				AOI Screen 3				AOI Screen 4	Is Constituent an AOI ?
									Is There a WRW PRG ?	Background M2SD	Number of Detections Above the Background M2SD	Frequency of Detection (%) Above the Background M2SD	Is the Maximum Concentration Above the Background M2SD ?	WRW PRG	Number of Detections Above the WRW PRG	Frequency of Detection (%) Above the WRW PRG	Is the Maximum Result Above the WRW PRG ?	Is Constituent Eliminated or Retained By Process Knowledge ?	
VOC	1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	49	0	0.00	2.30E+01	U	ug/kg	Yes	-----	-----	-----	---	2.38E+09	0	0.00	---	-----	No
VOC	1,1,2-Trichloroethane	79-00-5	248	0	0.00	1.60E+03	U	ug/kg	Yes	-----	-----	-----	---	2.80E+04	0	0.00	---	-----	No
VOC	1,1-Dichloroethane	75-34-3	249	0	0.00	1.60E+03	U	ug/kg	Yes	-----	-----	-----	---	2.72E+06	0	0.00	---	-----	No
VOC	1,1-Dichloroethene	75-35-4	248	1	0.40	2.00E+00	J	ug/kg	Yes	-----	-----	-----	---	1.74E+04	0	0.00	---	-----	No
VOC	1,2,3-Trichloropropane	96-18-4	49	0	0.00	2.30E+01	U	ug/kg	Yes	-----	-----	-----	---	2.08E+03	0	0.00	---	-----	No
VOC	1,2,4-Trimethylbenzene	95-63-6	49	6	12.24	4.60E+00	J	ug/kg	Yes	-----	-----	-----	---	1.33E+05	0	0.00	---	-----	No
VOC	1,2-Dibromoethane	106-93-4	49	0	0.00	2.30E+01	U	ug/kg	Yes	-----	-----	-----	---	3.51E+01	0	0.00	---	-----	No
VOC	1,2-Dichlorobenzene	95-50-1	264	0	0.00	2.70E+03	U	ug/kg	Yes	-----	-----	-----	---	2.89E+06	0	0.00	---	-----	No
VOC	1,2-Dichloroethane	107-06-2	245	1	0.41	5.00E+00	J	ug/kg	Yes	-----	-----	-----	---	1.33E+04	0	0.00	---	-----	No
VOC	1,2-Dichloroethene	540-59-0	200	1	0.50	3.00E+00	J	ug/kg	Yes	-----	-----	-----	---	1.00E+06	0	0.00	---	-----	No
VOC	1,2-Dichloropropane	78-87-5	248	0	0.00	1.60E+03	U	ug/kg	Yes	-----	-----	-----	---	3.84E+04	0	0.00	---	-----	No
VOC	1,3,5-Trimethylbenzene	108-67-8	49	0	0.00	2.30E+01	U	ug/kg	Yes	-----	-----	-----	---	1.14E+05	0	0.00	---	-----	No
VOC	1,3-Dichlorobenzene	541-73-1	313	0	0.00	3.60E+03	U	ug/kg	Yes	-----	-----	-----	---	3.33E+06	0	0.00	---	-----	No
VOC	1,4-Dichlorobenzene	106-46-7	264	0	0.00	2.70E+03	U	ug/kg	Yes	-----	-----	-----	---	9.13E+04	0	0.00	---	-----	No
VOC	1,4-Dioxane	123-91-1	1	0	0.00	5.00E+02	U	ug/kg	Yes	-----	-----	-----	---	3.78E+05	0	0.00	---	-----	No
VOC	2-Butanone	78-93-3	246	37	15.04	3.80E+02		ug/kg	Yes	-----	-----	-----	---	4.64E+07	0	0.00	---	-----	No
VOC	2-Chlorotoluene	95-49-8	49	0	0.00	2.30E+01	U	ug/kg	Yes	-----	-----	-----	---	2.22E+06	0	0.00	---	-----	No
VOC	2-Methyl-1-propanol	78-83-1	1	0	0.00	1.00E+02	U	ug/kg	Yes	-----	-----	-----	---	3.33E+07	0	0.00	---	-----	No
VOC	4-Methyl-2-pentanone	108-10-1	247	2	0.81	6.00E+00	J	ug/kg	Yes	-----	-----	-----	---	8.32E+07	0	0.00	---	-----	No
VOC	Acetone	67-64-1	250	51	20.40	8.90E+02	B	ug/kg	Yes	-----	-----	-----	---	1.00E+08	0	0.00	---	-----	No
VOC	Benzene	71-43-2	247	1	0.40	3.00E+00	J	ug/kg	Yes	-----	-----	-----	---	2.36E+04	0	0.00	---	-----	No
VOC	Bromodichloromethane	75-27-4	248	0	0.00	1.60E+03	U	ug/kg	Yes	-----	-----	-----	---	6.71E+04	0	0.00	---	-----	No
VOC	Bromoform	75-25-2	248	0	0.00	1.60E+03	U	ug/kg	Yes	-----	-----	-----	---	4.20E+05	0	0.00	---	-----	No
VOC	Bromomethane	74-83-9	248	6	2.42	5.00E+00	JB	ug/kg	Yes	-----	-----	-----	---	2.10E+04	0	0.00	---	-----	No
VOC	Carbon Disulfide	75-15-0	249	0	0.00	1.60E+03	U	ug/kg	Yes	-----	-----	-----	---	1.64E+06	0	0.00	---	-----	No
VOC	Carbon Tetrachloride	56-23-5	248	2	0.81	4.40E+02	J,B	ug/kg	Yes	-----	-----	-----	---	8.45E+03	0	0.00	---	-----	No
VOC	Chlorobenzene	108-90-7	246	0	0.00	1.60E+03	U	ug/kg	Yes	-----	-----	-----	---	6.67E+05	0	0.00	---	-----	No
VOC	Chloroethane	75-00-3	248	0	0.00	3.10E+03	U	ug/kg	Yes	-----	-----	-----	---	1.43E+06	0	0.00	---	-----	No
VOC	Chloroform	67-66-3	249	5	2.01	2.00E+00	BJ	ug/kg	Yes	-----	-----	-----	---	7.85E+03	0	0.00	---	-----	No
VOC	Chloromethane	74-87-3	244	0	0.00	3.10E+03	U	ug/kg	Yes	-----	-----	-----	---	1.15E+05	0	0.00	---	-----	No

Table 5.8
Sediment AOI Screening

Analyte Group	Analyte	Derived CAS No.	Number of Samples	Number of Detections	Frequency of Detection (%)	Maximum Concentration	Data Qualifier	Units	AOI Screen 1	AOI Screen 2				AOI Screen 3				AOI Screen 4	Is Constituent an AOI ?
									Is There a WRW PRG ?	Background M2SD	Number of Detections Above the Background M2SD	Frequency of Detection (%) Above the Background M2SD	Is the Maximum Concentration Above the Background M2SD ?	WRW PRG	Number of Detections Above the WRW PRG	Frequency of Detection (%) Above the WRW PRG	Is the Maximum Result Above the WRW PRG ?	Is Constituent Eliminated or Retained By Process Knowledge ?	
VOC	cis-1,2-Dichloroethene	156-59-2	49	1	2.04	4.80E+01		ug/kg	Yes	-----	-----	-----	---	1.11E+06	0	0.00	---	-----	No
VOC	cis-1,3-Dichloropropene	10061-01-5	248	0	0.00	1.60E+03	U	ug/kg	Yes	-----	-----	-----	---	1.94E+04	0	0.00	---	-----	No
VOC	Dibromochloromethane	124-48-1	248	0	0.00	1.60E+03	U	ug/kg	Yes	-----	-----	-----	---	4.95E+04	0	0.00	---	-----	No
VOC	Dichlorodifluoromethane	75-71-8	49	0	0.00	2.30E+01	U	ug/kg	Yes	-----	-----	-----	---	2.30E+05	0	0.00	---	-----	No
VOC	Ether	60-29-7	1	0	0.00	1.00E+01	U	ug/kg	Yes	-----	-----	-----	---	2.22E+07	0	0.00	---	-----	No
VOC	ethyl acetate	141-78-6	1	0	0.00	1.00E+01	U	ug/kg	Yes	-----	-----	-----	---	1.00E+08	0	0.00	---	-----	No
VOC	Ethylbenzene	100-41-4	247	2	0.81	9.00E+00		ug/kg	Yes	-----	-----	-----	---	5.39E+06	0	0.00	---	-----	No
VOC	Hexachloroethane	67-72-1	292	0	0.00	3.60E+03	U	ug/kg	Yes	-----	-----	-----	---	1.11E+05	0	0.00	---	-----	No
VOC	Isopropylbenzene	98-82-8	49	0	0.00	2.30E+01	U	ug/kg	Yes	-----	-----	-----	---	3.27E+04	0	0.00	---	-----	No
VOC	Methylene Chloride	75-09-2	255	55	21.57	4.20E+02	J	ug/kg	Yes	-----	-----	-----	---	2.72E+05	0	0.00	---	-----	No
VOC	Styrene	100-42-5	247	0	0.00	1.60E+03	U	ug/kg	Yes	-----	-----	-----	---	1.38E+07	0	0.00	---	-----	No
VOC	Tetrachloroethene	127-18-4	247	7	2.83	3.80E+01		ug/kg	Yes	-----	-----	-----	---	6.71E+03	0	0.00	---	-----	No
VOC	Toluene	108-88-3	250	60	24.00	8.60E+02	J	ug/kg	Yes	-----	-----	-----	---	3.09E+06	0	0.00	---	-----	No
VOC	trans-1,2-Dichloroethene	156-60-5	49	1	2.04	2.00E+00	J	ug/kg	Yes	-----	-----	-----	---	2.87E+05	0	0.00	---	-----	No
VOC	trans-1,3-Dichloropropene	10061-02-6	248	0	0.00	1.60E+03	U	ug/kg	Yes	-----	-----	-----	---	2.08E+04	0	0.00	---	-----	No
VOC	Trichloroethene	79-01-6	248	6	2.42	4.80E+01		ug/kg	Yes	-----	-----	-----	---	1.77E+03	0	0.00	---	-----	No
VOC	Trichlorofluoromethane	75-69-4	49	13	26.53	5.00E+00	J	ug/kg	Yes	-----	-----	-----	---	1.51E+06	0	0.00	---	-----	No
VOC	Vinyl Acetate	108-05-4	148	0	0.00	3.80E+01	U	ug/kg	Yes	-----	-----	-----	---	2.65E+06	0	0.00	---	-----	No
VOC	Vinyl Chloride	75-01-4	249	1	0.40	1.68E+01		ug/kg	Yes	-----	-----	-----	---	2.17E+03	0	0.00	---	-----	No
VOC	Xylene, total	1330-20-7	247	5	2.02	6.80E+01		ug/kg	Yes	-----	-----	-----	---	1.06E+06	0	0.00	---	-----	No
WQP	Cyanide	57-12-5	7	1	14.29	2.30E+02	B	ug/kg	Yes	-----	-----	-----	---	2.22E+06	0	0.00	---	-----	No
WQP	Fluoride	16984-48-8	42	22	52.38	2.03E+04		ug/kg	Yes	-----	-----	-----	---	6.67E+06	0	0.00	---	-----	No
WQP	Nitrate (as N)	ConID 184	69	25	36.23	8.93E+04	H	ug/kg	Yes	3.84E+04	1	1.45	Yes	1.78E+08	0	0.00	---	-----	No
WQP	Nitrate/Nitrite (as N)	ConID 184	124	81	65.32	7.60E+04		ug/kg	Yes	3.84E+04	4	3.23	Yes	1.78E+08	0	0.00	---	-----	No
WQP	Nitrite (as N)	ConID 187	36	1	2.78	5.61E+03	H	ug/kg	Yes	4.03E+02	1	2.78	Yes	1.11E+07	0	0.00	---	-----	No
RAD	Uranium-238	7440-61-1	423	423	100.00	5.90E+01		pCi/g	Yes	3.38E+00	23	5.44	Yes	2.93E+01	1	0.24	Yes	Eliminated	No
METAL	Thallium	7440-28-0	376	60	15.96	1.00E+04		ug/kg	Yes	8.21E+02	16	4.26	Yes	7.78E+03	1	0.27	Yes	Eliminated	No
METAL	Silver	7440-22-4	371	64	17.25	3.10E+06		ug/kg	Yes	2.04E+03	23	6.20	Yes	5.55E+05	1	0.27	Yes	Eliminated	No
METAL	Antimony	7440-36-0	355	52	14.65	5.13E+04		ug/kg	Yes	1.01E+04	17	4.79	Yes	4.44E+04	1	0.28	Yes	Eliminated	No
PCB	PCB-1260	11096-82-5	311	7	2.25	2.00E+03	P	ug/kg	Yes	-----	-----	-----	---	1.35E+03	1	0.32	Yes	Eliminated	No

Table 5.8
Sediment AOI Screening

Analyte Group	Analyte	Derived CAS No.	Number of Samples	Number of Detections	Frequency of Detection (%)	Maximum Concentration	Data Qualifier	Units	AOI Screen 1	AOI Screen 2				AOI Screen 3				AOI Screen 4	Is Constituent an AOI ?
									Is There a WRW PRG ?	Background M2SD	Number of Detections Above the Background M2SD	Frequency of Detection (%) Above the Background M2SD	Is the Maximum Concentration Above the Background M2SD ?	WRW PRG	Number of Detections Above the WRW PRG	Frequency of Detection (%) Above the WRW PRG	Is the Maximum Result Above the WRW PRG ?	Is Constituent Eliminated or Retained By Process Knowledge ?	
SVOC	Dibenz(a,h)anthracene	53-70-3	289	22	7.61	5.30E+02	J	ug/kg	Yes	-----	-----	-----	---	3.79E+02	1	0.35	Yes	Eliminated	No
PCB	PCB-1254	11097-69-1	317	72	22.71	5.20E+03		ug/kg	Yes	-----	-----	-----	---	1.35E+03	3	0.95	Yes	Eliminated	No
RAD	Americium-241	86954-36-1	461	339	73.54	5.65E+01		pCi/g	Yes	4.27E-02	238	51.63	Yes	7.69E+00	6	1.30	Yes	-----	Yes
METAL	Iron	7439-89-6	386	386	100.00	5.50E+07		ug/kg	Yes	2.32E+07	29	7.51	Yes	3.33E+07	7	1.81	Yes	Eliminated	No
RAD	Radium-226	13982-63-3	113	112	99.12	3.08E+00		pCi/g	Yes	1.72E+00	13	11.50	Yes	2.69E+00	3	2.65	Yes	Eliminated	No
RAD	Plutonium-239/240		481	400	83.16	2.17E+02		pCi/g	Yes	5.09E-02	308	64.03	Yes	9.80E+00	16	3.33	Yes	-----	Yes
METAL	Chromium	7440-47-3	386	372	96.37	1.40E+05		ug/kg	Yes	2.45E+04	39	10.10	Yes	2.84E+04	16	4.15	Yes	-----	Yes
METAL	Aluminum	7429-90-5	386	386	100.00	4.90E+07		ug/kg	Yes	1.80E+07	66	17.10	Yes	2.48E+07	22	5.70	Yes	Eliminated	No
SVOC	Benzo(a)pyrene	50-32-8	290	106	36.55	1.30E+03		ug/kg	Yes	-----	-----	-----	---	3.79E+02	28	9.66	Yes	-----	Yes
METAL	Manganese	7439-96-5	386	386	100.00	2.50E+06		ug/kg	Yes	6.69E+05	15	3.89	Yes	4.19E+05	50	12.95	Yes	Eliminated	No
RAD	Cesium-134	13967-70-9	137	75	54.74	2.60E-01		pCi/g	Yes	2.54E-01	1	0.73	Yes	8.00E-02	25	18.25	Yes	Eliminated	No
RAD	Cesium-137	10045-97-3	226	172	76.11	1.50E+00		pCi/g	Yes	9.60E-01	3	1.33	Yes	2.21E-01	62	27.43	Yes	Eliminated	No
METAL	Arsenic	7440-38-2	385	374	97.14	2.79E+04		ug/kg	Yes	6.26E+03	98	25.45	Yes	2.41E+03	313	81.30	Yes	-----	Yes
RAD	Radium-228	15262-20-1	95	94	98.95	4.10E+00		pCi/g	Yes	3.80E+00	1	1.05	Yes	1.11E-01	93	97.89	Yes	Eliminated	No

Note: The PCBs identified above under the Analyte column are equivalent to Aroclors, for example PCB-1254 is the same as Aroclor-1254.

----- Not Applicable

The frequency of detection of the analyte concentration above the PRG is greater than 0 percent and less than 1 percent.

The frequency of detection of the analyte concentration above the PRG is greater than or equal to 1 % and less than 5 percent.

The frequency of detection of the analyte concentration above the PRG is greater than 5 percent.

The results presented in this table are ordered by increasing frequency of detection above the WRW PRG.

Table 5.9
Sediment AOIs Eliminated or Retained Based on Process Knowledge

Analyte	Basis for Eliminating a Constituent as a Sediment AOI
PCB-1254 PCB-1260	Only one occurrence of PCB-1254 and PCB-1260 were found above the PRG and occurred at the outfall of the drainage pipe from Building 991. This area has been remediated and the sediments removed, thus eliminating the only occurrence of PCBs above the PRG.
Dibenz(a,h)anthracene	Dibenz(a,h)anthracene was not retained as a sediment AOI because it has a frequency of detection less than 1 percent. The RFCA Parties agreed that sediment analytes with a frequency of detection less than 1 percent are not AOIs.
Aluminum	Aluminum was not retained as a sediment AOI because it is a ubiquitous, naturally occurring constituent of the particulates that compose the sediments. Aluminum and aluminum chemicals were used at the site in various metallurgical operations; however, aluminum was not carried forward as a material of concern for the ChemRisk process (K-H 2005a).
Antimony	Antimony was not retained as a sediment AOI because it has a frequency of detection less than 1 percent. The RFCA Parties agreed that sediment analytes with a frequency of detection less than 1 percent are not AOIs.
Iron	Iron was not retained as a sediment AOI because it is a ubiquitous, naturally occurring constituent of the particulates that compose the sediments. Iron commonly occurs as a chemical component of the particulate, suspended ferric oxyhydroxides, and as coatings on particulates. Based on results of different exposure scenarios, iron was not carried forward as a material of concern for the ChemRisk process (K-H 2005a).
Manganese	Manganese was not retained as a sediment AOI because it is a ubiquitous, naturally-occurring constituent of the particulates that compose the sediments. Manganese was not identified or discussed in building process information (CDH 1992; DOE 2004a). Manganese has not been found associated with UBC Sites (DOE 2004a). Only small quantities were identified to be in inventory with the exception of manganous sulfate which had an inventory in 1974 of 2,560 kg and then later in 1988 of 0.06 kg (the specific use was not clear in the ChemRisk reports). Based on results of different exposure scenarios, manganese was not carried forward as a material of concern for the ChemRisk process (K-H 2005a).
Silver	Silver was not retained as a sediment AOI because it has a frequency of detection less than 1 percent. The RFCA Parties agreed that sediment analytes with a frequency of detection less than 1 percent are not AOIs.
Thallium	Thallium was not retained as a sediment AOI because it has a frequency of detection less than 1 percent. The RFCA Parties agreed that sediment analytes with a frequency of detection less than 1 percent are not AOIs.
Cesium-134	A review of possible contaminants of concern at RFETS identified cesium-134 as a radionuclide used for research, analytical, and calibration activities (for example, sealed and plated sources) (K-H 2005a). Based on limited quantities, cesium-134 release to the environment was estimated to be minimal or there would be no release. The detection of cesium-134 (along with other radionuclides) in environmental samples from 1970 through 1981 was consistent with the presence of fission products from worldwide fallout and the levels were typical of other sites sampled in the western United States. The Background Soils Characterization Program conducted in the early 1990s stated that cesium-134, cesium-137, and strontium-89+90 were not windborne contaminants from RFETS (DOE 1995). Cesium-134 has a half-life of 2.06 years. Cesium-134 is distributed in regional soils as a result of fallout from nuclear-weapons explosions (DOE 1995).

Table 5.9
Sediment AOIs Eliminated or Retained Based on Process Knowledge

Analyte	Basis for Eliminating a Constituent as a Sediment AOI
Cesium-137	A review of possible contaminants of concern at RFETS identified cesium-137 as a radionuclide used for research, analytical, and calibration activities (for example, sealed and plated sources) (K-H 2005a). Based on limited quantities, cesium-137 release to the environment was estimated to be minimal or there would be no release. The detection of cesium-137 (along with other radionuclides) in environmental samples from 1970 through 1981 was consistent with the presence of fission products from worldwide fallout and the levels were typical of other sites sampled in the western United States. The Background Soils Characterization Program conducted in the early 1990s stated that cesium-134, cesium-137, and strontium-89+90 were not windborne contaminants from RFETS (DOE 1995). In addition, the Citizen's Environmental Sampling Committee (CESC) conducted an off-site soil sampling study in 1993 and 1994. Background levels of cesium-137 were detected in some soil samples; however, this report concluded that "no evidence has been found to suggest that cesium-137 or strontium-90 were released during the operational period of the Rocky Flats Plant (CESC 1996)." Cesium-137 has a half-life of 30.0 years. Cesium-137 is distributed in regional soils as a result of fallout from nuclear-weapons explosions (DOE 1995). In a September 2005 report summarizing the June 2005 aerial radiological survey of the site, the report concluded that the observed cesium-137 soil activity levels within the site were consistent with known worldwide fallout levels that have been measured throughout the United States and there was no indication that any of the cesium-137 deposition detected was due to past RFETS operations (K-H 2005a).
Radium-226	Radium-226 was not retained as a sediment AOI because of the limited use of radium at Rocky Flats and the limited areal extent of total radium at the site. Information presented in the ChemRisk Task 1 Report (CDH 1991) concerning radium indicates that radium-226, a daughter of uranium-238 decay, was used in small quantities for research, analysis, and calibration (for example, sealed and plated sources). In addition, the only radium-226 waste generated at RFETS, based on WEMS and WSRIC, was as sealed sources. However, radium-226 could be potentially derived from both natural uranium present in the region and uranium metal fabrication and processing conducted at the site. Because of the limited quantity of radium-226 used and its waste form, it was not carried forward through the ChemRisk process (CDH 1991).
Radium-228	Radium-228 was not retained as a sediment AOI because of the limited use of thorium at Rocky Flats and the limited areal extent of total radium at the site. radium-228 was not identified in the ChemRisk Task 1 Report as a radionuclide used at Rocky Flats (CDH 1991). Furthermore, no radium-228 waste was reported to have been generated based on WEMS and WSRIC. However, thorium-232, the parent radionuclide for radium-228, was used at RFETS to fabricate metal parts from thorium and thorium alloys in Building 881. Thorium and its compounds were also used in analytical procedures and other research and development programs in Building 771. It was concluded during the development of the ChemRisk reports that thorium-232 was most likely released as airborne particulates and was not a significant component of airborne effluent (CDH 1991). Furthermore, thorium-232 was not used in significant quantities relative to other production radionuclides; thus, a source term was not developed for thorium-232 during the ChemRisk evaluation.
Uranium-238	Uranium-238 was not retained as a sediment AOI because it has a frequency of detection less than 1 percent. The RFCA Parties agreed that sediment analytes with a frequency of detection less than 1 percent are not AOIs.

Note: The PCBs identified above under the Analyte column are equivalent to Aroclors, for example PCB-1254 is the same as Aroclor-1254.

Table 5.10
Sediment AOIs

Analyte Group	Analyte	Derived CAS No.	Number of Samples	Number of Detections	Frequency of Detection (%)	Maximum Concentration	Data Qualifier	Units	AOI Screen 1	AOI Screen 2				AOI Screen 3				AOI Screen 4	Is Constituent an AOI ?
									Is There a WRW PRG ?	Background M2SD	Number of Detections Above the Background M2SD	Frequency of Detection (%) Above the Background M2SD	Is the Maximum Concentration Above the Background M2SD ?	WRW PRG	Number of Detections Above the WRW PRG	Frequency of Detection (%) Above the WRW PRG	Is the Maximum Result Above the WRW PRG ?	Is Constituent Eliminated or Retained By Process Knowledge ?	
RAD	Americium-241	86954-36-1	461	339	73.54	5.65E+01		pCi/g	Yes	4.27E-02	238	51.63	Yes	7.7	6	1.30	Yes	-----	Yes
RAD	Plutonium-239/240		481	400	83.16	2.17E+02		pCi/g	Yes	5.09E-02	308	64.03	Yes	10	16	3.33	Yes	-----	Yes
METAL	Chromium	7440-47-3	386	372	96.37	1.40E+05		ug/kg	Yes	2.45E+04	39	10.10	Yes	28418	16	4.15	Yes	-----	Yes
SVOC	Benzo(a)pyrene	50-32-8	290	106	36.55	1.30E+03		ug/kg	Yes	-----	-----	-----	---	379	28	9.66	Yes	-----	Yes
METAL	Arsenic	7440-38-2	385	374	97.14	2.79E+04		ug/kg	Yes	6.26E+03	98	25.45	Yes	2409	313	81.30	Yes	-----	Yes

----- Not Applicable

The frequency of detection of the analyte concentration above the PRG is greater than or equal to 1 percent and less than 5 percent.

The frequency of detection of the analyte concentration above the PRG is greater than 5 percent.

The results presented in this table are ordered by increasing frequency of detection above the WRW PRG.

Table 5.11
Summary of Sediment AOIs by Drainage Basin

Drainage Basin	Sediment AOI
Walnut Creek, Woman Creek	Benzo(a)pyrene
Walnut Creek, Woman Creek, Rock Creek, Lower Smart Ditch	Arsenic
Walnut Creek, Woman Creek	Chromium
Walnut Creek	Americium-241
Walnut Creek, Woman Creek	Plutonium-239/240

FIGURES

Figure 5.1

Surface Water Monitoring Locations

KEY

- Sample collected since January 1, 2000
- Sample collected between January 1, 1995 and December 31, 1999
- Sample collected between June 28, 1991 and December 31, 1999

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary
- Topographic contour (20-foot)

N
W E
S

0 600 1,200 Feet

Scale 1:7,200

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental
Technology Site

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Figure 5.2

Sediment Sampling Locations

KEY

- Sample collected since January 1, 2000
- Sample collected between January 1, 1995 and December 31, 1999
- Sample collected between June 28, 1991 and December 31, 1999

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary
- Topographic contour (20-foot)

N
W E
S

0 600 1,200 Feet

Scale 1:7,200

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
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File: W:\Projects\FY2005\RIFS_Fig\Sec05\ArcMap\Fig_5_02_SED_Locs.mxd

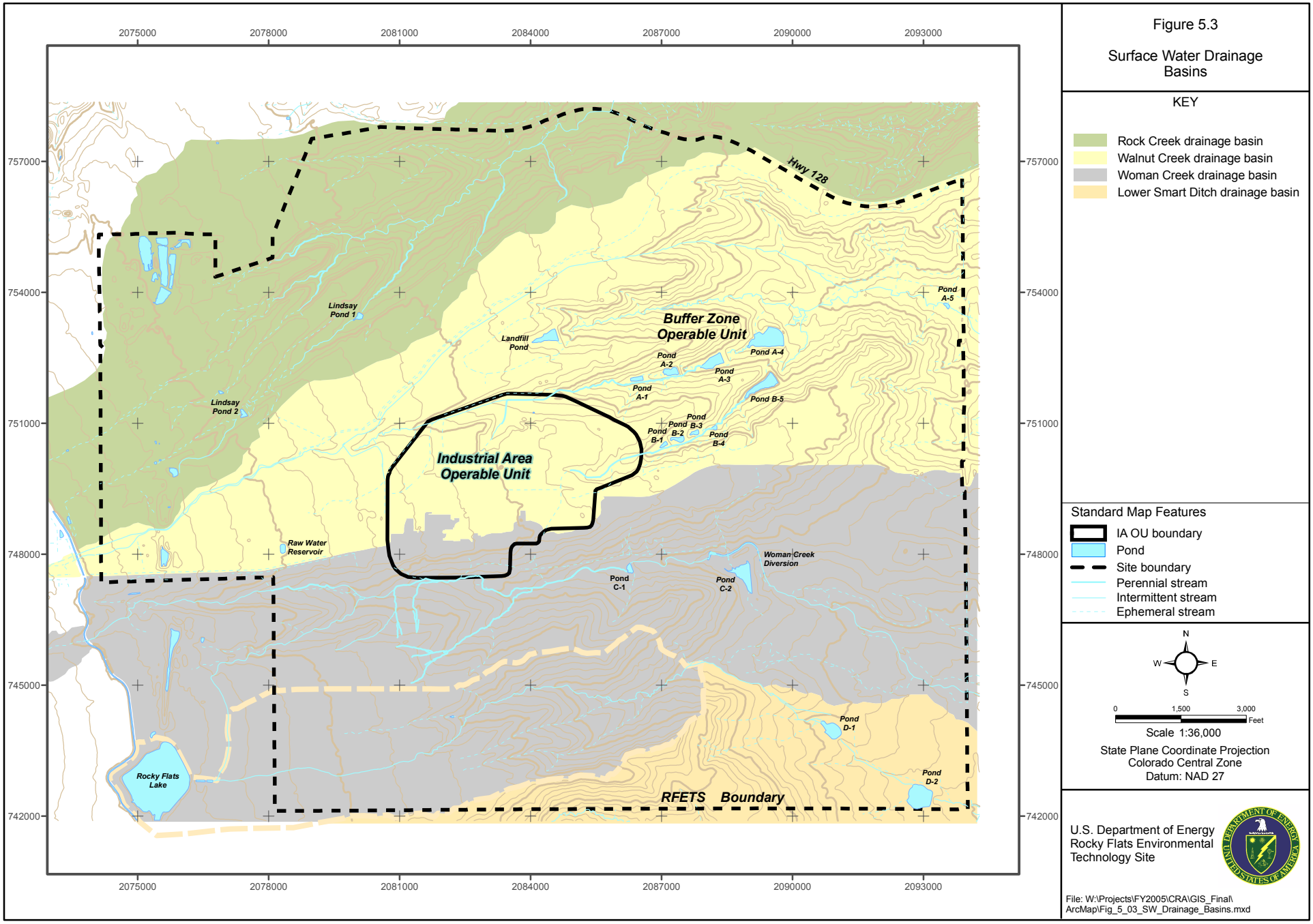


Figure 5.3

Surface Water Drainage Basins

KEY

- Rock Creek drainage basin
- Walnut Creek drainage basin
- Woman Creek drainage basin
- Lower Smart Ditch drainage basin

Standard Map Features

- IA OU boundary
- Pond
- Site boundary
- Perennial stream
- Intermittent stream
- Ephemeral stream

N
W E
S

0 1,500 3,000 Feet

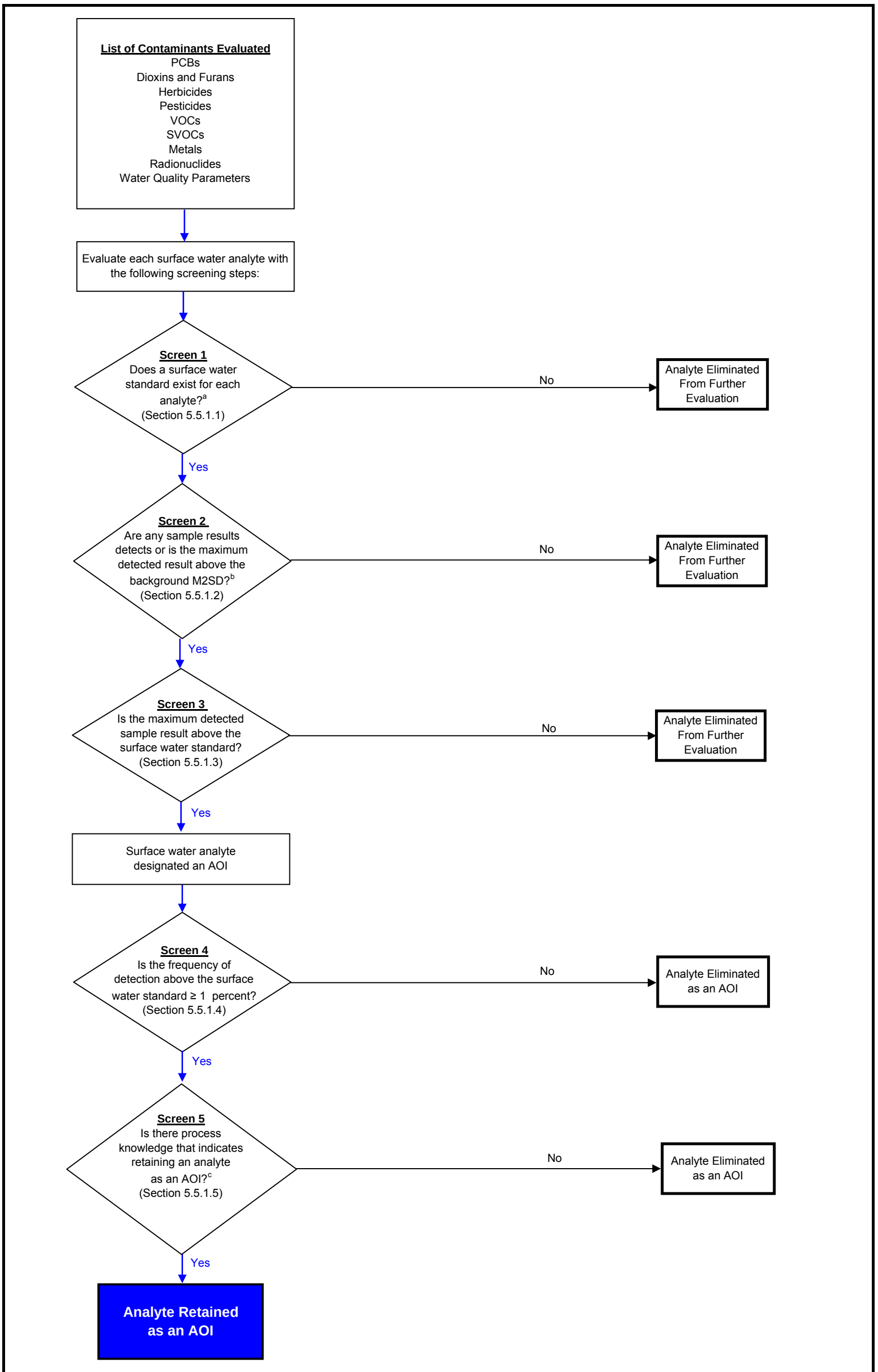
Scale 1:36,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

File: W:\Projects\FY2005\CRA\GIS_Final\ArcMap\Fig_5_03_SW_Drainage_Basins.mxd

Figure 5.4
Surface Water AOI Screening Process



Notes:

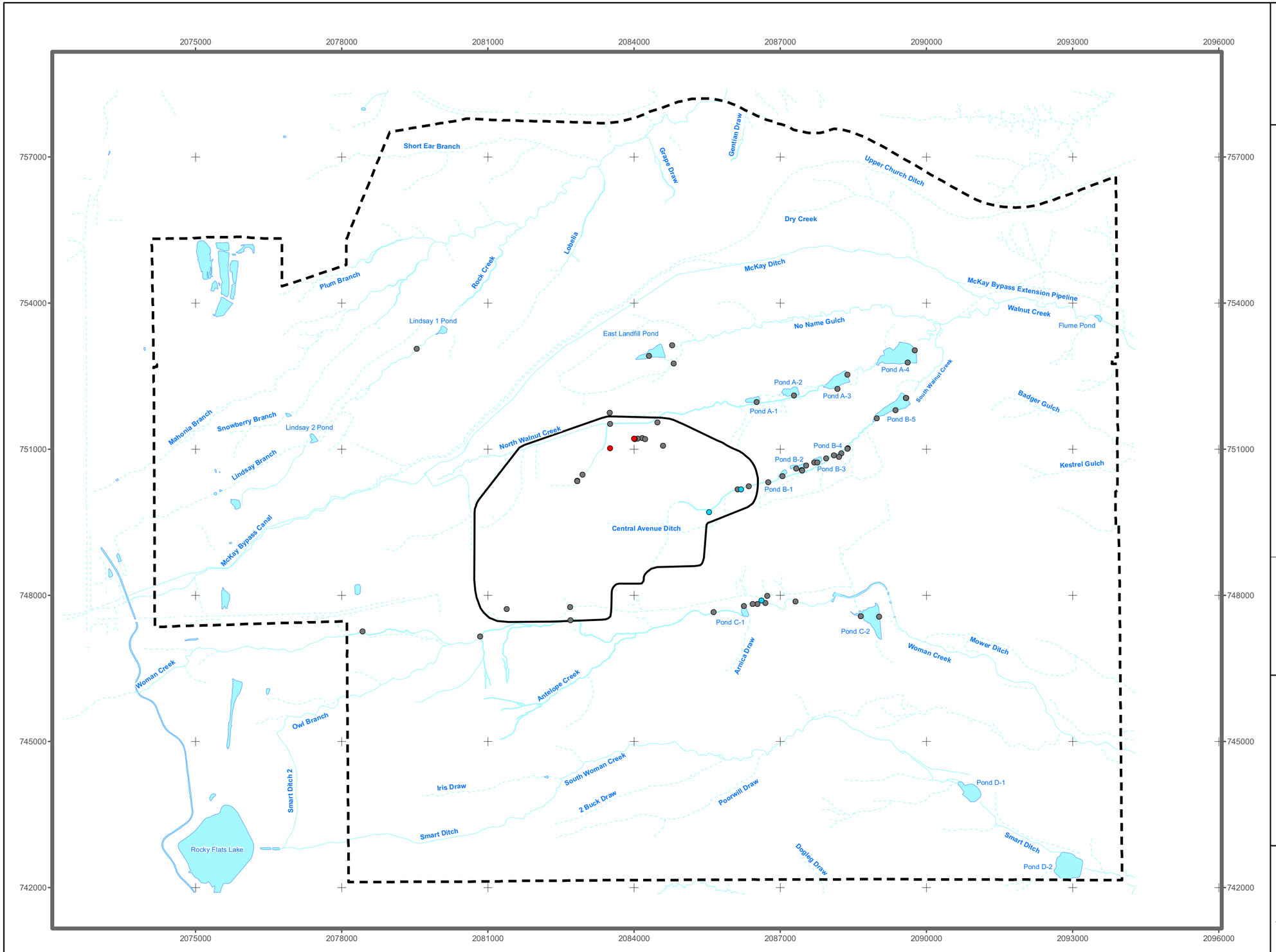
[a]If the practical quantitation limit (PQL) is higher than the surface water standard, the PQL is used as the comparison value.

[b]Background mean + two standard deviation (M2SD) values used to evaluate surface water nature and extent were developed as part of the Comprehensive Risk Assessment (DOE, 2005b). For constituents (organic compounds, some inorganic, and some radionuclides) that do not have background values, it was assumed that detection of these constituents indicates their presence in the environment.

[c]DOE recognizes that process knowledge at RFETS is not perfectly known. However, process knowledge alone is not used to retain or eliminate a constituent as an AOI. Other analyte criteria such as its areal distribution relative to RFETS activities, its proximity to contaminant sources, accelerated actions performed to remove contaminant source(s), and its natural occurrence and distribution in the environment are also considered when evaluating whether to retain or eliminate a constituent as an AOI.

Figure 5.5

Carbon Tetrachloride Concentrations in Surface Water



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- ● > Surface Water Standard
- ● Not applicable
- ● Detected and <= Surface Water Standard
- ● Not detected

Minimum nondetect reported value = 2.00E-01 ug/L
Maximum nondetect reported value = 1.00E+01 ug/L
CWQCC surface water standard = 2.30E-01 ug/L
Background M2SD = NA
Practical quantitation limit (PQL) = 1.00E+00 ug/L

Notes:
- Data presented on the figure represent the most recent surface water analyte result for samples collected between 01/01/2000 and 07/31/2005.
- See Table 5.6 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

N
W E
S

0 1,000 2,000 Feet

Scale 1:24,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
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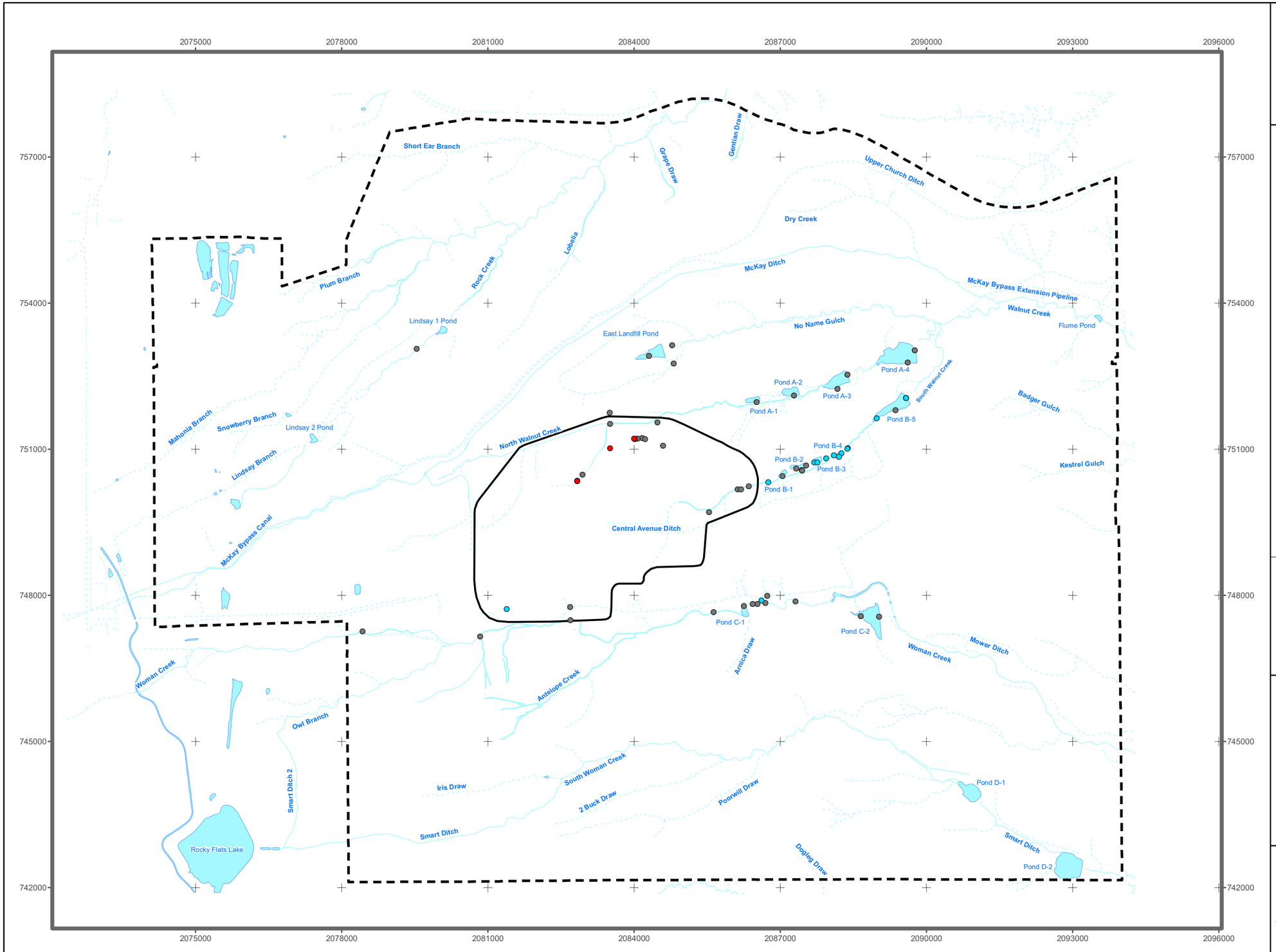
Figure 5.6

Chloroform Concentrations in Surface Water



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- ● > Surface Water Standard
- ● Not applicable
- ● Detected and <= Surface Water Standard
- ● Not detected

Minimum nondetect reported value = 5.00E-01 ug/L
Maximum nondetect reported value = 1.00E+01 ug/L
CWQCC surface water standard = 3.40E+00 ug/L
Background M2SD = NA
Practical quantitation limit (PQL) = 1.00E+00 ug/L

Notes:
- Data presented on the figure represent the most recent surface water analyte result for samples collected between 01/01/2000 and 07/31/2005.
- See Table 5.6 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

N
W E
S

0 1,000 2,000 Feet

Scale 1:24,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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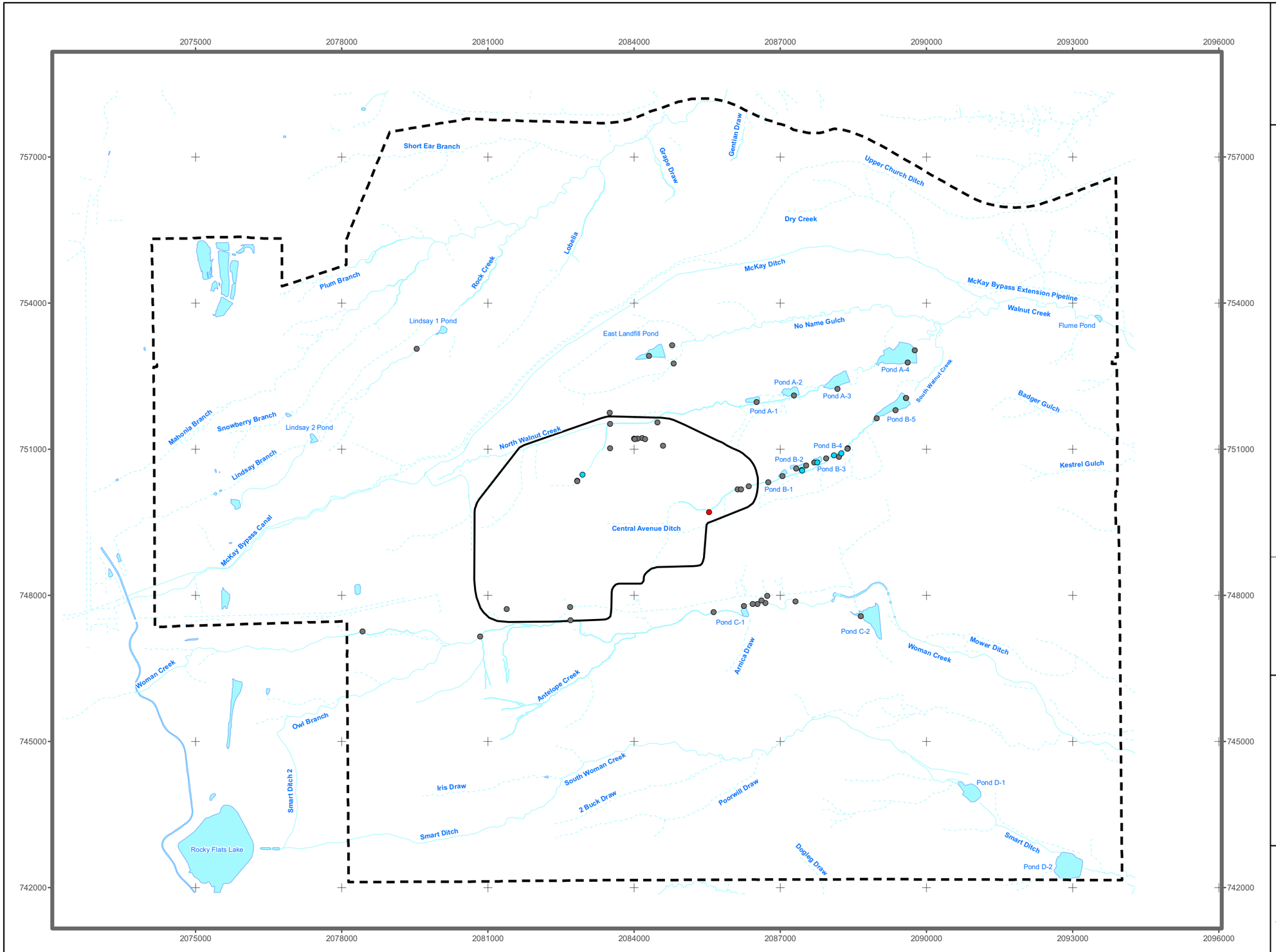
Figure 5.7

cis-1,2-Dichloroethene Concentrations in Surface Water



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- ● > Surface Water Standard
- ● Not applicable
- ● Detected and <= Surface Water Standard
- ● Not detected

Minimum nondetect reported value = 2.00E-01 ug/L
Maximum nondetect reported value = 5.00E+00 ug/L
CWQCC surface water standard = 7.00E+01 ug/L
Background M2SD = NA
Practical quantitation limit (PQL) = 5.00E+00 ug/L

Notes:
- Data presented on the figure represent the most recent surface water analyte result for samples collected between 01/01/2000 and 07/31/2005.
- See Table 5.6 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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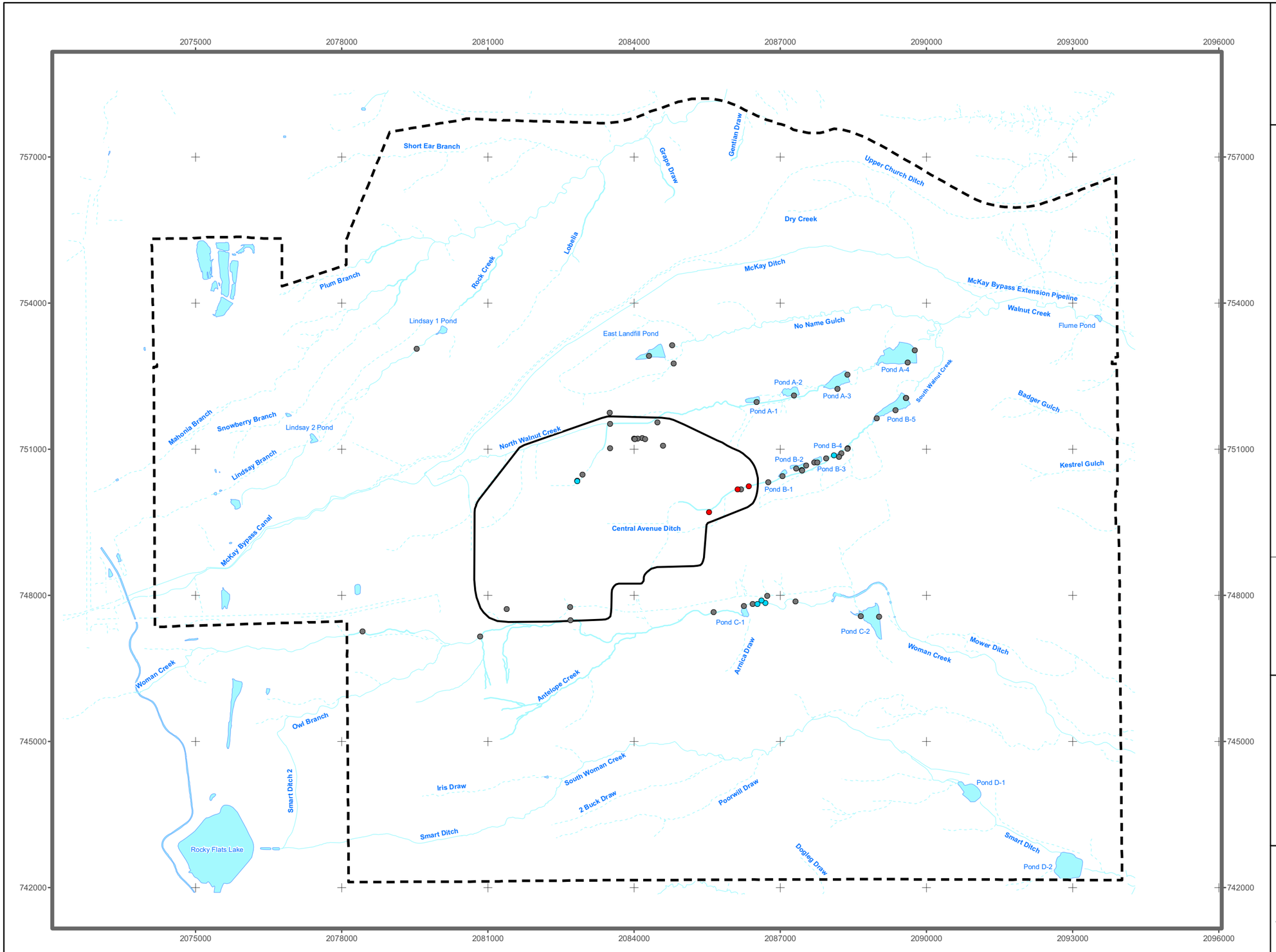
Figure 5.8

Methylene Chloride Concentrations in Surface Water



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- ● > Surface Water Standard
- ● Not applicable
- ● Detected and <= Surface Water Standard
- ● Not detected

Minimum nondetect reported value = 5.00E-01 ug/L
Maximum nondetect reported value = 1.60E+01 ug/L
CWQCC surface water standard = 4.60E+00 ug/L
Background M2SD = NA
Practical quantitation limit (PQL) = 1.00E+00 ug/L

Notes:
- Data presented on the figure represent the most recent surface water analyte result for samples collected between 01/01/2000 and 07/31/2005.
- See Table 5.6 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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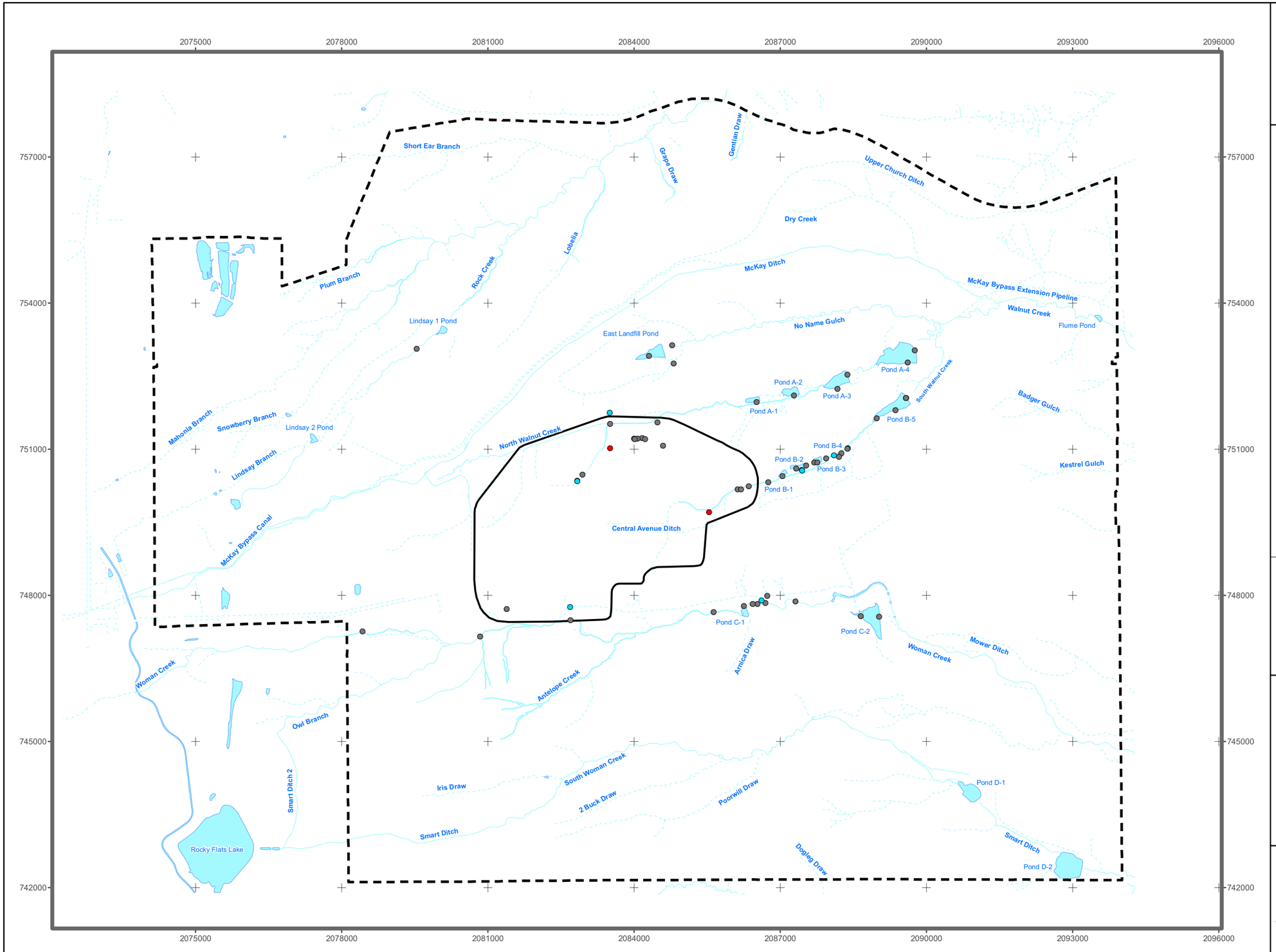
Figure 5.9

Tetrachloroethene Concentrations in Surface Water



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- ● > Surface Water Standard
- ● Not applicable
- ● Detected and <= Surface Water Standard
- ● Not detected

Minimum nondetect reported value = 1.00E+00 ug/L
Maximum nondetect reported value = 1.00E+01 ug/L
CWQCC surface water standard = 6.90E-01 ug/L
Background M2SD = NA
Practical quantitation limit (PQL) = 1.00E+00 ug/L

Notes:
- Data presented on the figure represent the most recent surface water analyte result for samples collected between 01/01/2000 and 07/31/2005.
- See Table 5.6 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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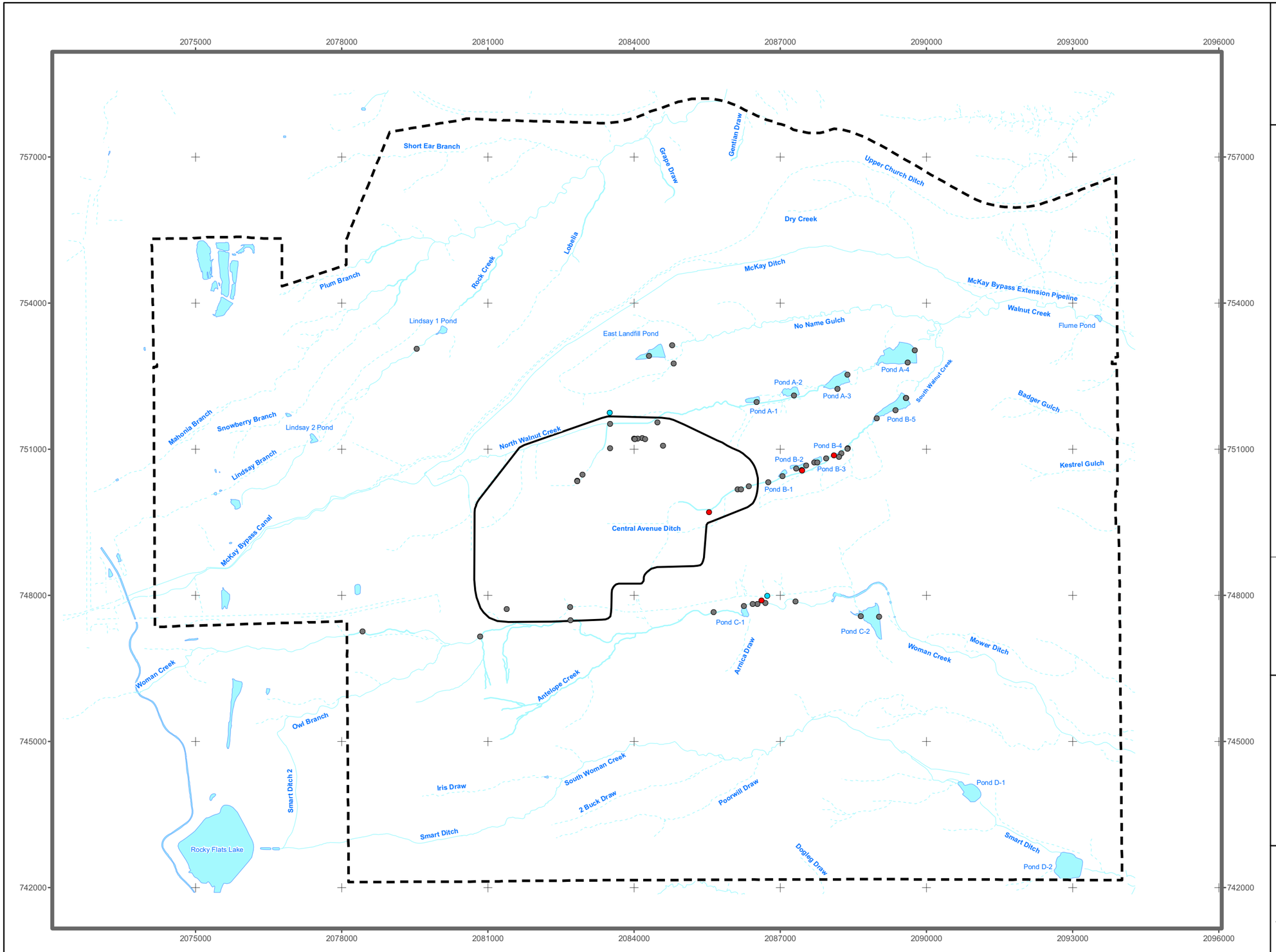
Figure 5.10

Trichloroethene Concentrations in Surface Water



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- ● > Surface Water Standard
- ● Not applicable
- ● Detected and <= Surface Water Standard
- ● Not detected

Minimum nondetect reported value = 2.00E-01 ug/L
Maximum nondetect reported value = 1.00E+01 ug/L
CWQCC surface water standard = 2.50E+00 ug/L
Background M2SD = NA
Practical quantitation limit (PQL) = 1.00E+00 ug/L

Notes:
- Data presented on the figure represent the most recent surface water analyte result for samples collected between 01/01/2000 and 07/31/2005.
- See Table 5.6 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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State Plane Coordinate Projection
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Datum: NAD 27

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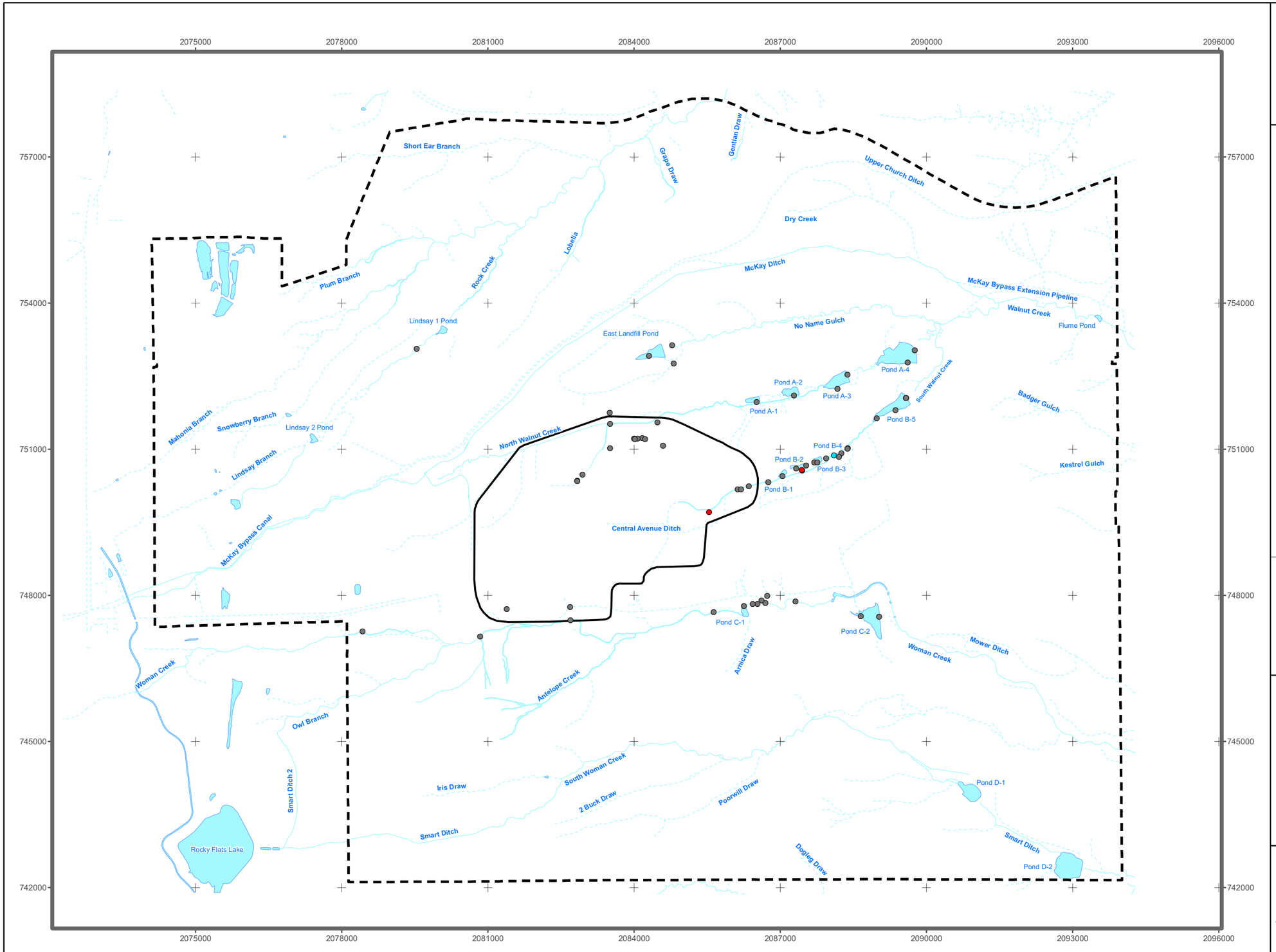
Figure 5.11

Vinyl Chloride Concentrations in Surface Water



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- ● > Surface Water Standard
- ● Not applicable
- ● Detected and <= Surface Water Standard
- ● Not detected

Minimum nondetect reported value = 3.00E-01 ug/L
Maximum nondetect reported value = 1.00E+01 ug/L
CWQCC surface water standard = 2.30E-02 ug/L
Background M2SD = NA
Practical quantitation limit (PQL) = 2.00E+00 ug/L

Notes:
- Data presented on the figure represent the most recent surface water analyte result for samples collected between 01/01/2000 and 07/31/2005.
- See Table 5.6 for additional information.

Standard Map Features
- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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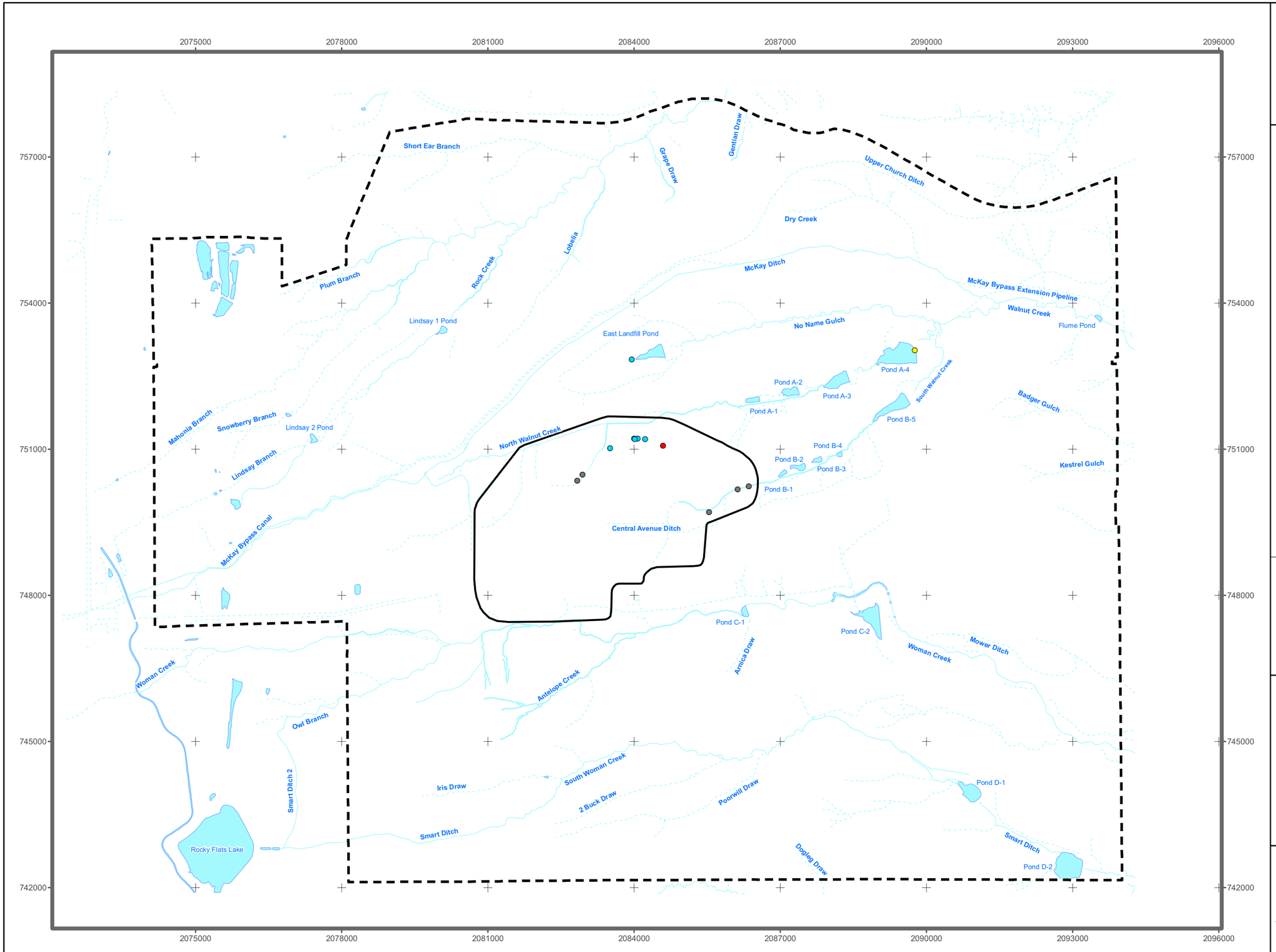

Figure 5.12

Dissolved Aluminum Concentrations in Surface Water

KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- ● > Background M2SD
- ● > Surface Water Standard and <= Background M2SD
- ● Detected and <= Surface Water Standard
- ● Not detected

Minimum nondetect reported value = 1.30E+00 ug/L
Maximum nondetect reported value = 4.03E+01 ug/L
CWQCC surface water standard = 8.70E+01 ug/L
Background M2SD = 4.30E+02 ug/L
Practical quantitation limit (PQL) = 1.70E+01 ug/L

Notes:
- Data presented on the figure represent the most recent surface water analyte result for samples collected between 01/01/2000 and 07/31/2005.
- See Table 5.6 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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State Plane Coordinate Projection
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Datum: NAD 27

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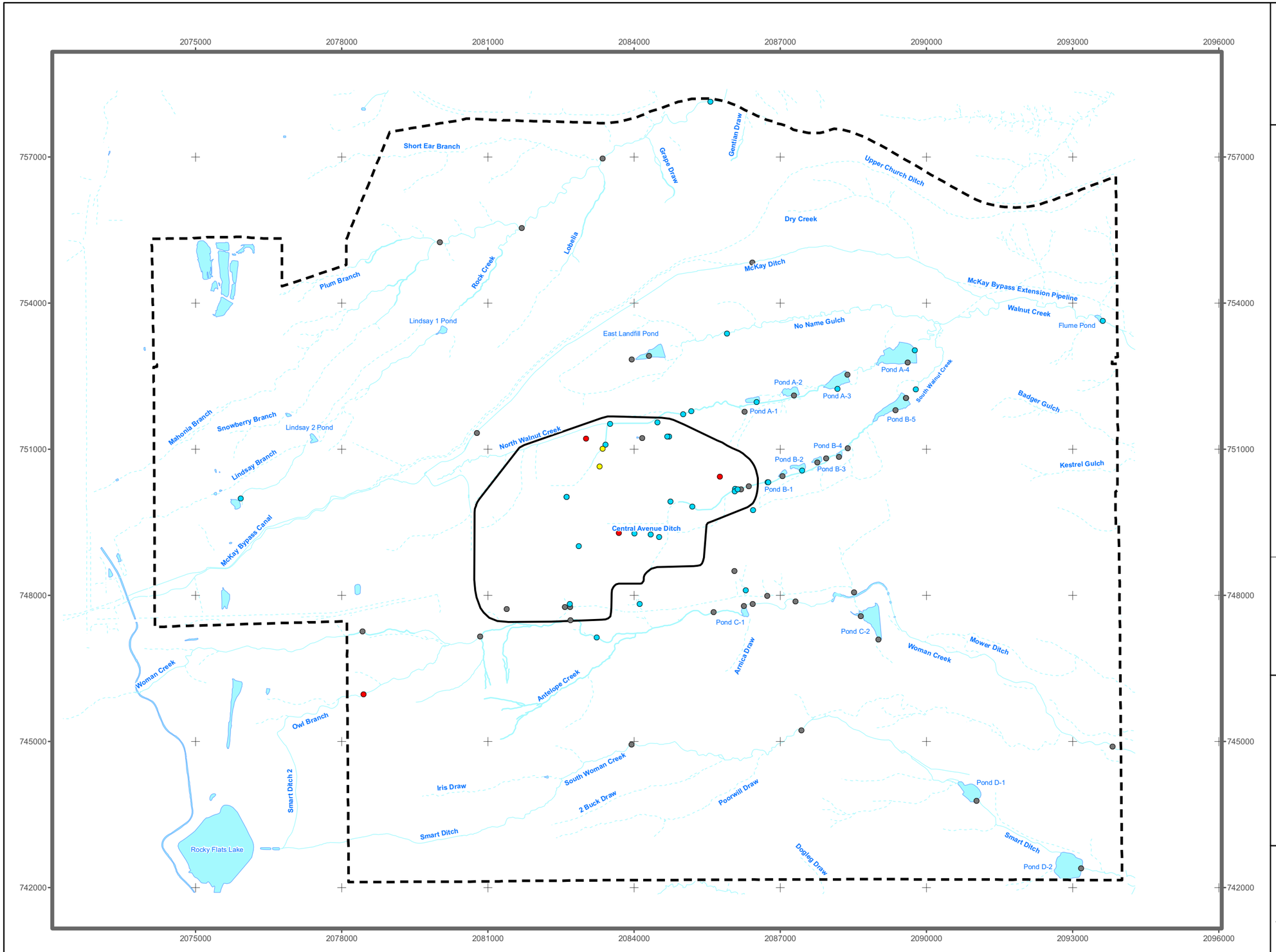
Figure 5.13

Total Beryllium Concentrations in Surface Water



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- > Surface Water Standard
- > Background M2SD and <= Surface Water Standard
- Detected and <= Background M2SD
- Not detected

Minimum nondetect reported value = 2.00E-02 ug/L
Maximum nondetect reported value = 1.30E+00 ug/L
CWQCC surface water standard = 4.00E+00 ug/L
Background M2SD = 2.49E+00 ug/L
Practical quantitation limit (PQL) = 5.00E+00 ug/L

Notes:
- Data presented on the figure represent the most recent surface water analyte result for samples collected between 01/01/2000 and 07/31/2005.
- See Table 5.6 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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State Plane Coordinate Projection
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Datum: NAD 27

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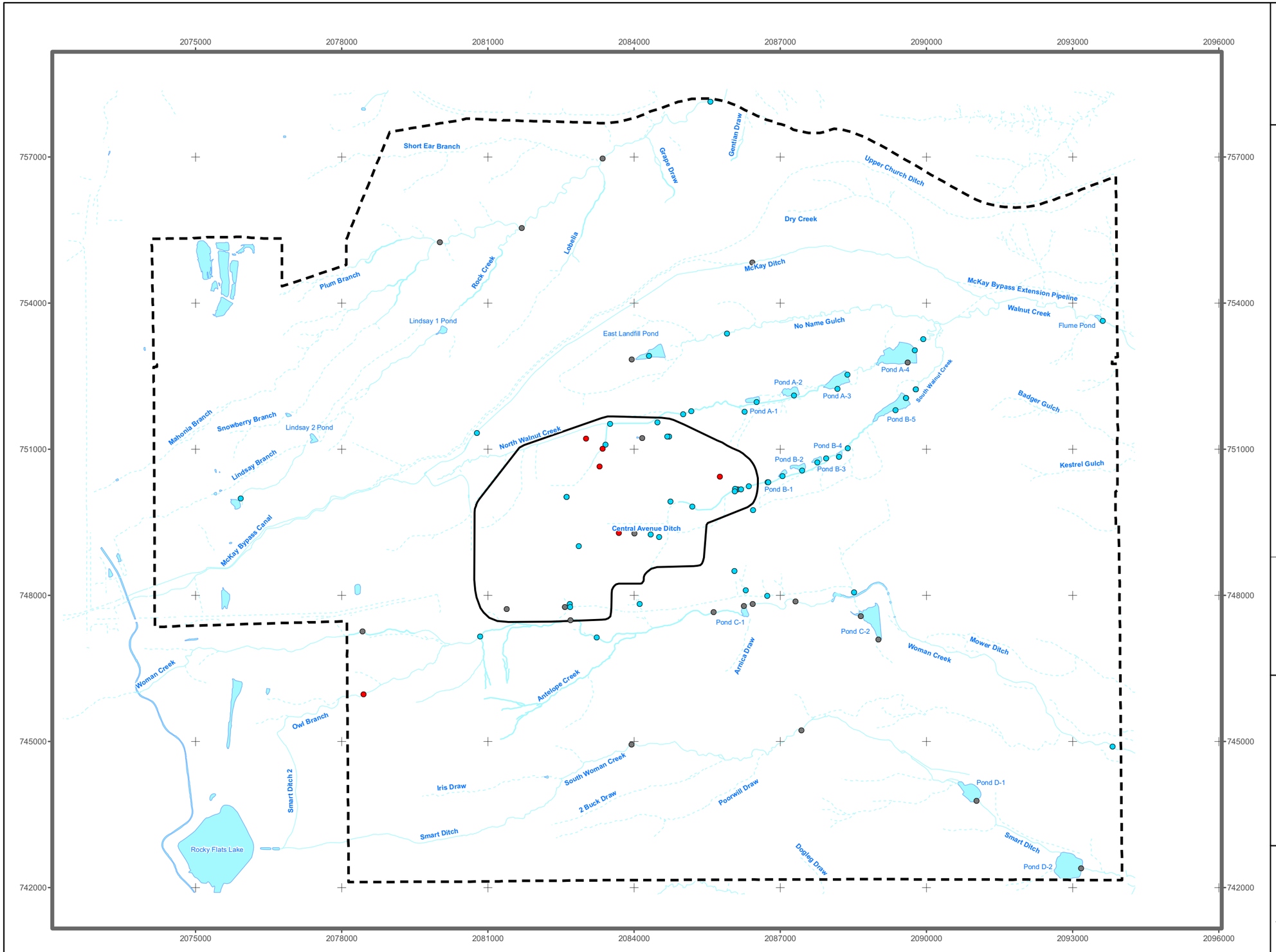
Figure 5.14

Total Chromium Concentrations in Surface Water



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- > Background M2SD
- > Surface Water Standard and <= Background M2SD
- Detected and <= Surface Water Standard
- Not detected

Minimum nondetect reported value = 1.00E-01 ug/L
Maximum nondetect reported value = 1.73E+01 ug/L
CWQCC surface water standard = 5.00E+01 ug/L
Background M2SD = 5.64E+01 ug/L
Practical quantitation limit (PQL) = 2.00E+00 ug/L

Notes:
- Data presented on the figure represent the most recent surface water analyte result for samples collected between 01/01/2000 and 07/31/2005.
- See Table 5.6 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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State Plane Coordinate Projection
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Datum: NAD 27

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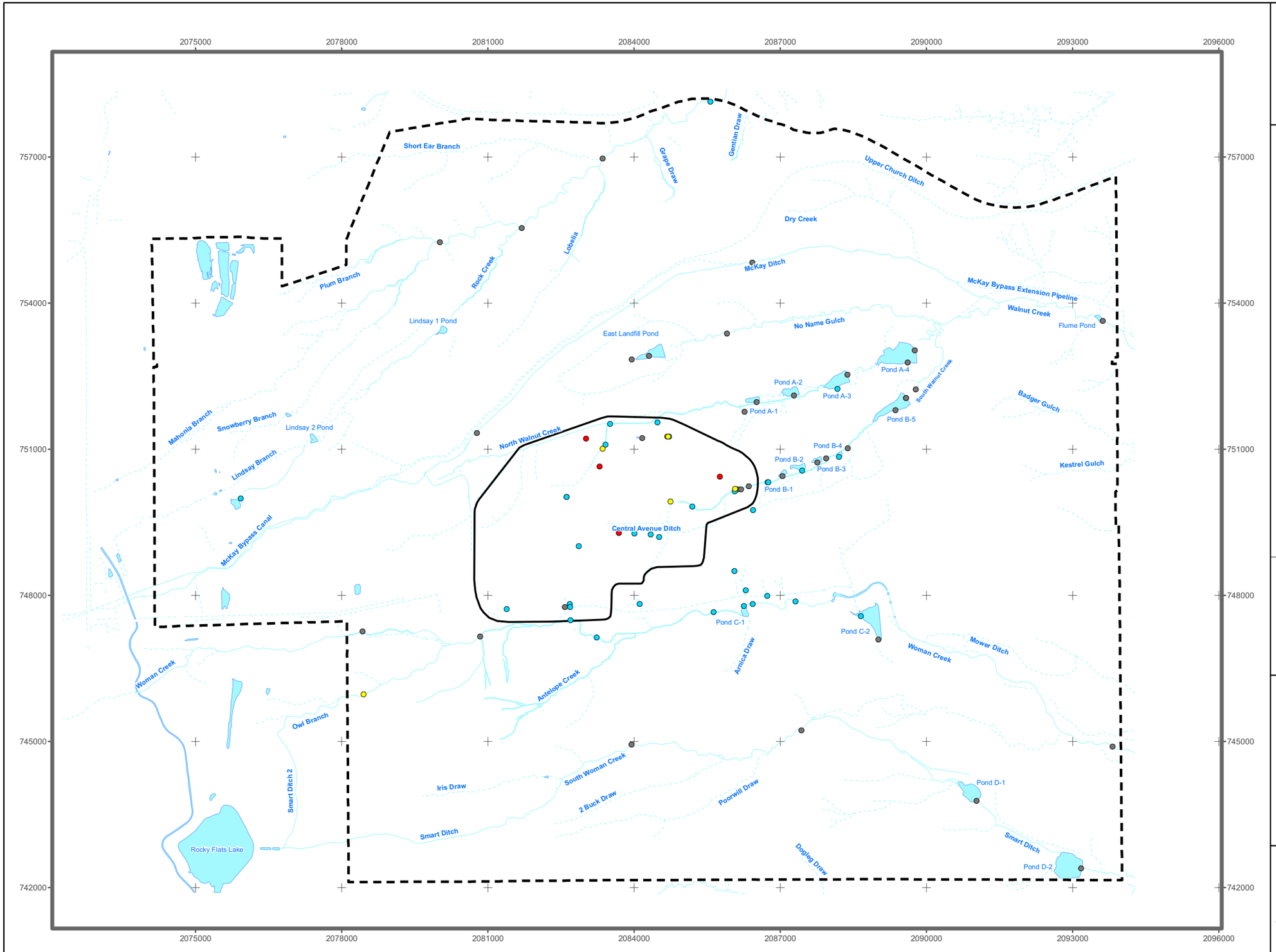
Figure 5.15

Total Lead Concentrations in Surface Water



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- > Surface Water Standard
- > Background M2SD and <= Surface Water Standard
- Detected and <= Background M2SD
- Not detected

Minimum nondetect reported value = 4.20E-01 ug/L
Maximum nondetect reported value = 3.70E+00 ug/L
CWQCC surface water standard = 5.00E+01 ug/L
Background M2SD = 1.82E+01 ug/L
Practical quantitation limit (PQL) = 1.00E+01 ug/L

Notes:
- Data presented on the figure represent the most recent surface water analyte result for samples collected between 01/01/2000 and 07/31/2005.
- See Table 5.6 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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State Plane Coordinate Projection
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Datum: NAD 27

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Figure 5.16

Total Nickel Concentrations in Surface Water

KEY

- Sample collected since January 1, 2000
- Sample collected between January 1, 1995 and December 31, 1999
- Sample collected between June 28, 1991 and December 31, 1994
- > Surface Water Standard
- > Background M2SD and <= Surface Water Standard
- Detected and <= Background M2SD
- Not detected

Minimum nondetect reported value = 2.50E-01 ug/L
Maximum nondetect reported value = 8.60E+00 ug/L
CWQCC surface water standard = 1.00E+02 ug/L
Background M2SD = 3.56E+01 ug/L
Practical quantitation limit (PQL) = 2.00E+01 ug/L

Notes:
- Data presented on the figure represent the most recent surface water analyte result for samples collected between 01/01/2000 and 07/31/2005.
- See Table 5.6 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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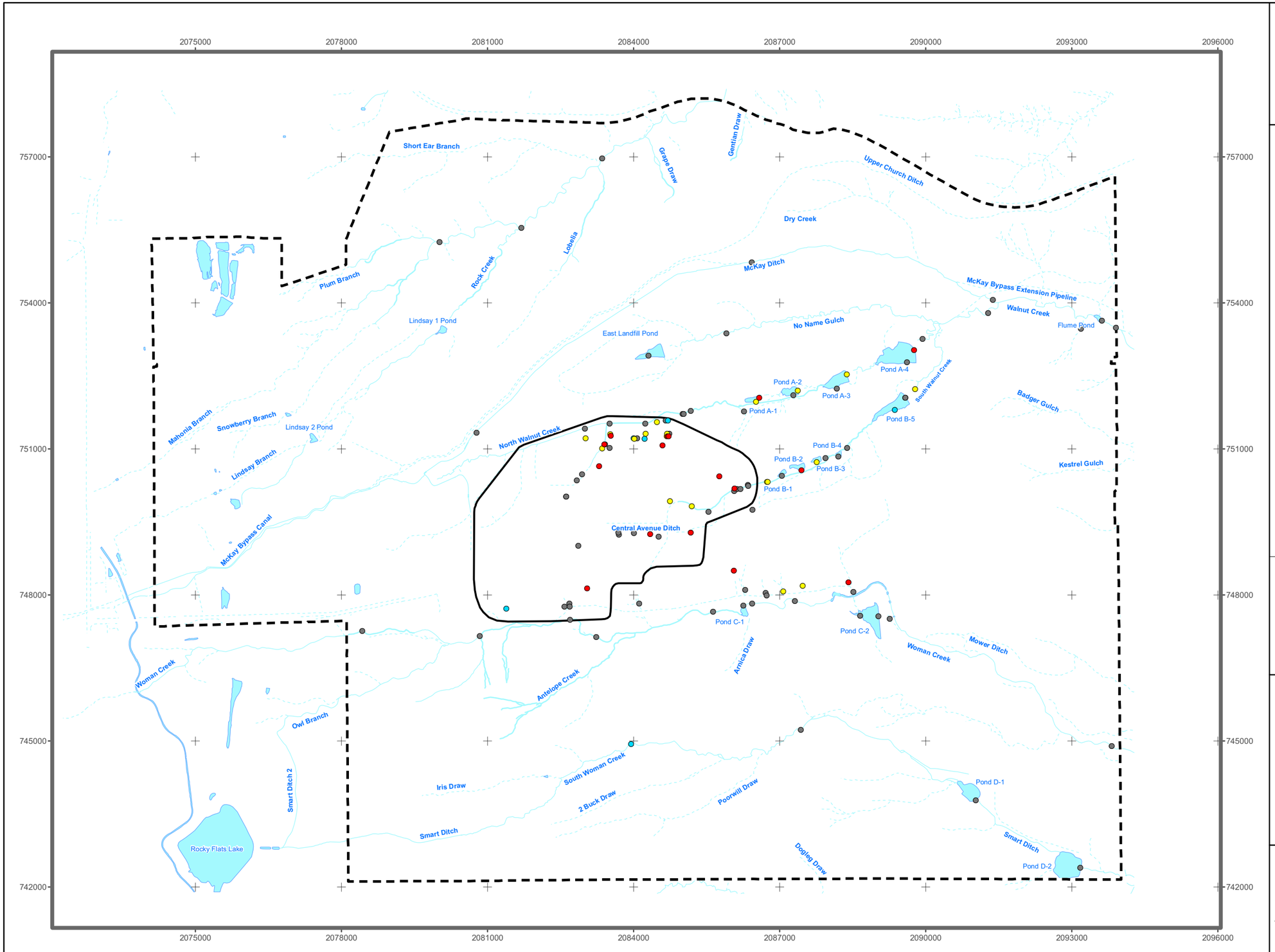
Figure 5.17

Total Americium-241 Activity in Surface Water



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- ● > Surface Water Standard
- ● > Background M2SD and <= Surface Water Standard
- ● Detected and <= Background M2SD
- ● Not detected

Minimum nondetect reported value = -1.20E-02 pCi/L
Maximum nondetect reported value = 3.14E-01 pCi/L
CWQCC surface water standard = 1.50E-01 pCi/L
Background M2SD = 2.33E-02 pCi/L
Practical quantitation limit (PQL) = 3.00E-02 pCi/L

Notes:
- Data presented on the figure represent the most recent surface water analyte result for samples collected between 01/01/2000 and 07/31/2005.
- See Table 5.6 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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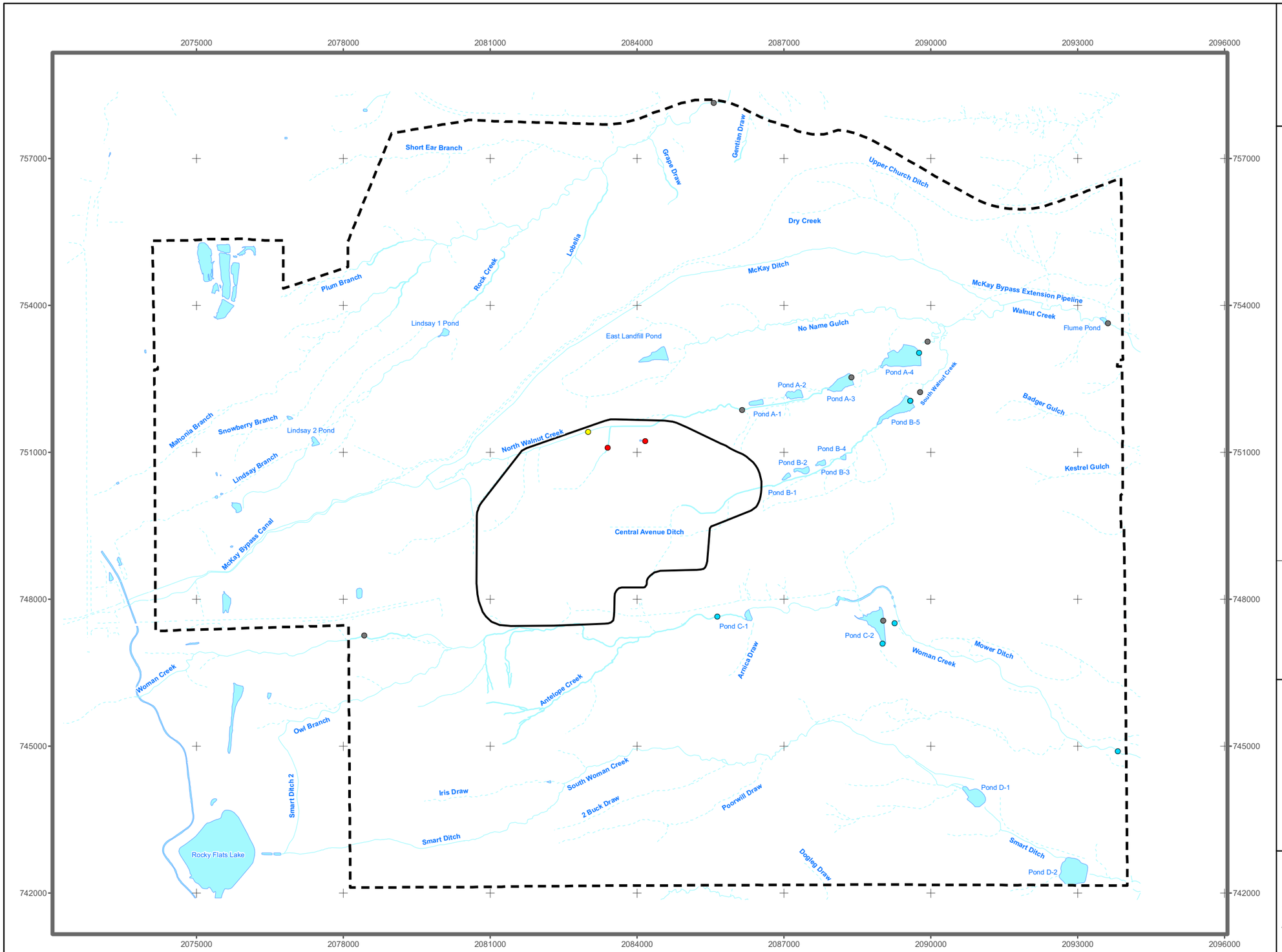
Figure 5.18

Total Gross Alpha Activity in Surface Water



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- > Background M2SD
- > Surface Water Standard and <= Background M2SD
- Detected and <= Surface Water Standard
- Not detected

Minimum nondetect reported value = 1.17E-01 pCi/L
Maximum nondetect reported value = 6.49E+01 pCi/L
CWQCC surface water standard = 7.00E+00 pCi/L
Background M2SD = 1.83E+01 pCi/L
Practical quantitation limit (PQL) = 2.00E+00 pCi/L

Notes:
- Data presented on the figure represent the most recent surface water analyte result for samples collected between 01/01/2000 and 07/31/2005.
- See Table 5.6 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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State Plane Coordinate Projection
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Datum: NAD 27

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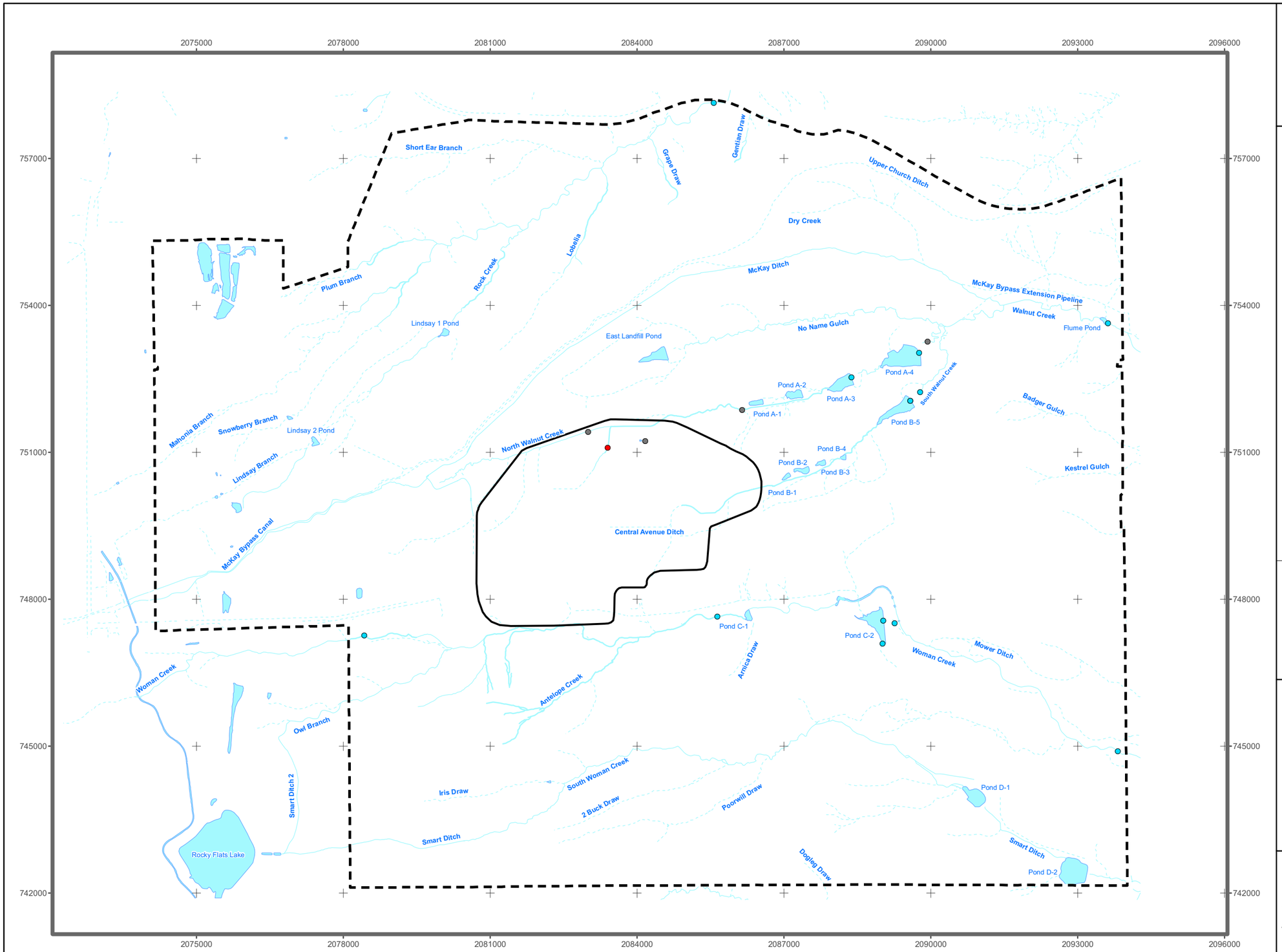
Figure 5.19

Total Gross Beta Activity in Surface Water



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- ● > Background M2SD
- ● > Surface Water Standard and <= Background M2SD
- ● Detected and <= Surface Water Standard
- ● Not detected

Minimum nondetect reported value = -3.20E+00 pCi/L
Maximum nondetect reported value = 4.69E+01 pCi/L
CWQCC surface water standard = 8.00E+00 pCi/L
Background M2SD = 1.50E+01 pCi/L
Practical quantitation limit (PQL) = 4.00E+00 pCi/L

Notes:
- Data presented on the figure represent the most recent surface water analyte result for samples collected between 01/01/2000 and 07/31/2005.
- See Table 5.6 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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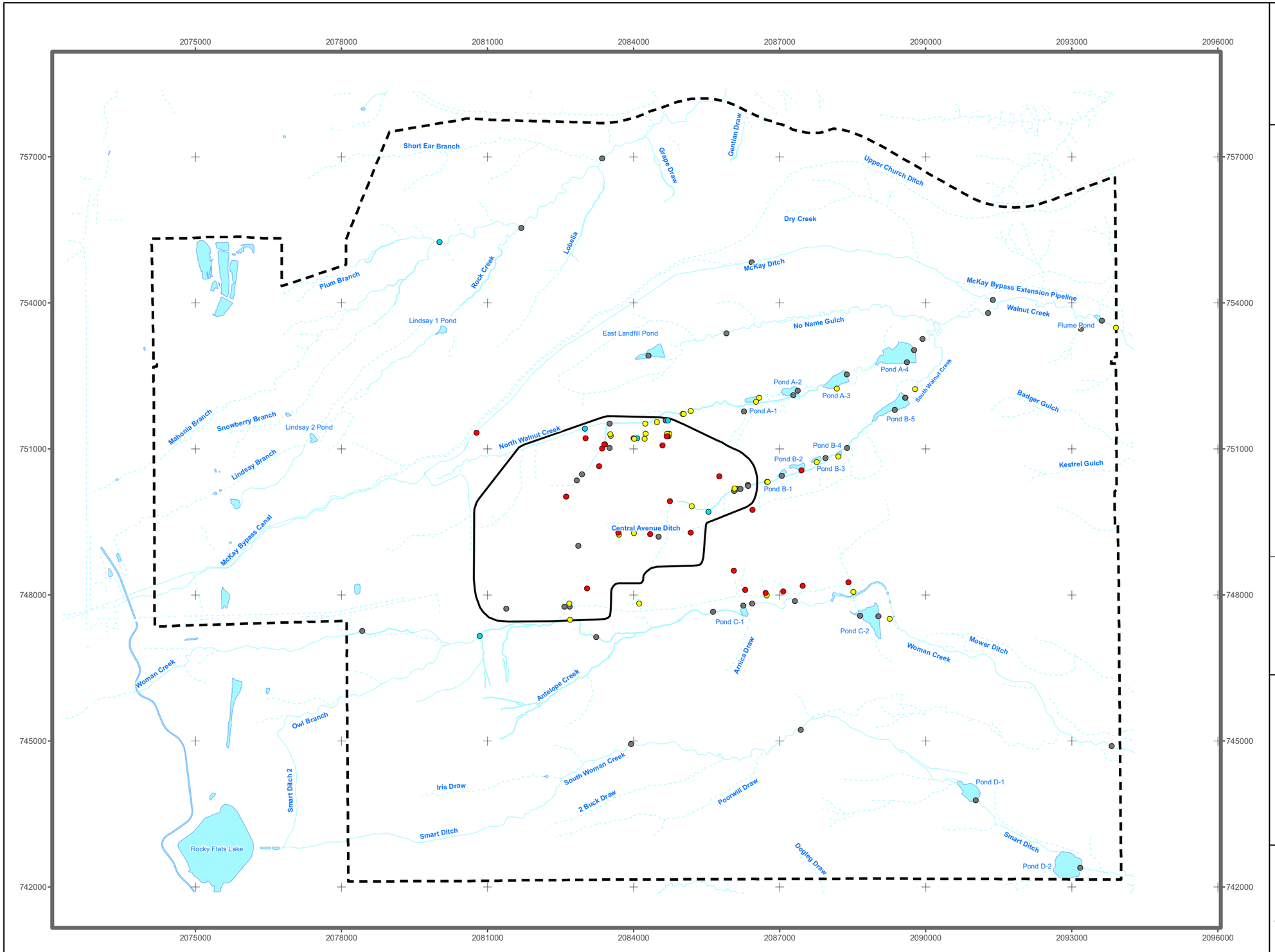
Figure 5.20

Total Plutonium-239/240 Activity in Surface Water



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- ● > Surface Water Standard
- ● > Background M2SD and <= Surface Water Standard
- ● Detected and <= Background M2SD
- ● Not detected

Minimum nondetect reported value = -1.60E-02 pCi/L
Maximum nondetect reported value = 2.01E-01 pCi/L
CWQCC surface water standard = 1.50E-01 pCi/L
Background M2SD = 1.87E-02 pCi/L
Practical quantitation limit (PQL) = 3.00E-02 pCi/L

Notes:
- Data presented on the figure represent the most recent surface water analyte result for samples collected between 01/01/2000 and 07/31/2005.
- See Table 5.6 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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Datum: NAD 27

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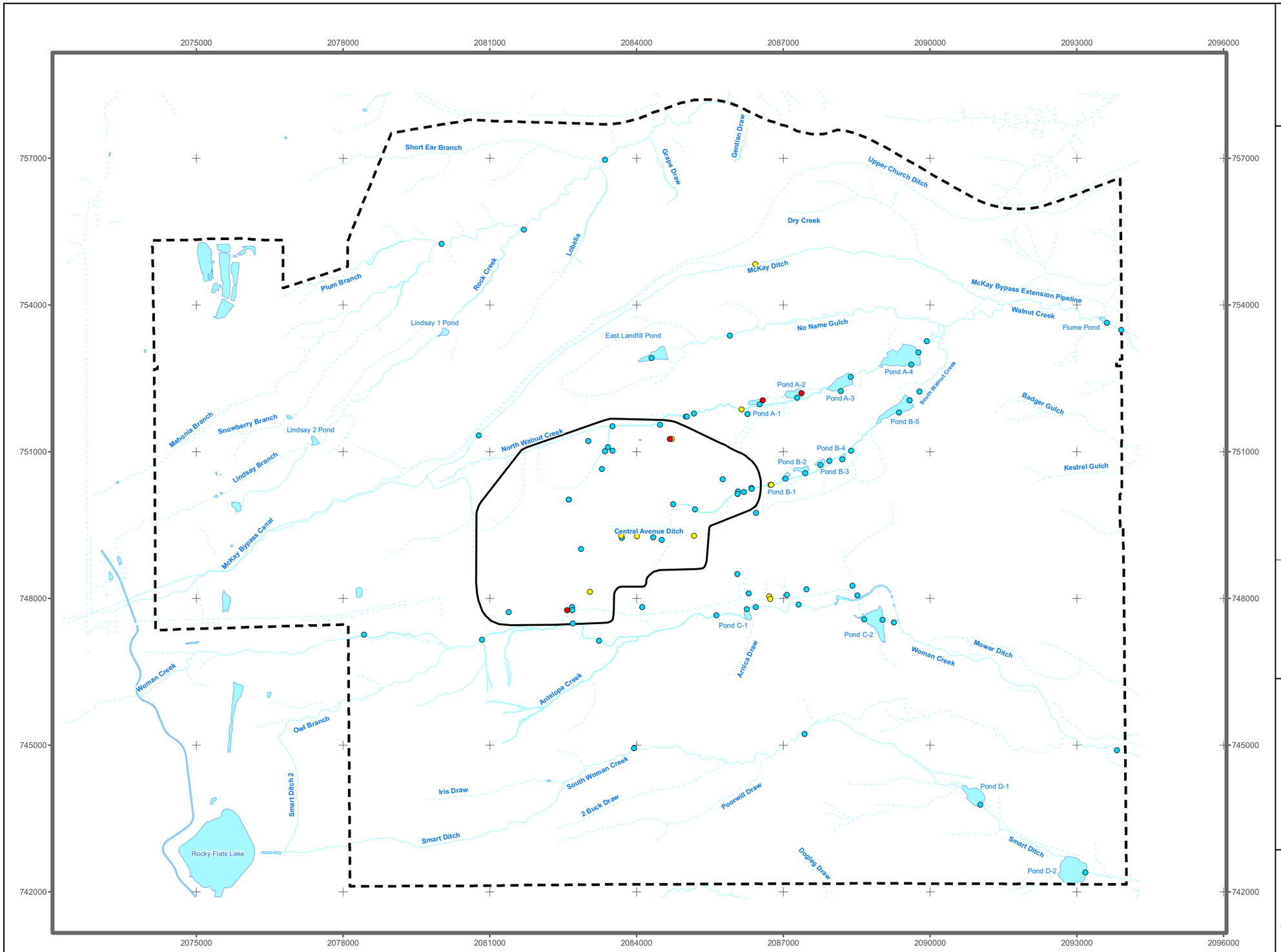

Figure 5.21

Total Uranium Isotopes Activity in Surface Water

KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- > Surface Water Standard
- > Background M2SD and <= Surface Water Standard
- Detected and <= Background M2SD
- Not detected

Minimum nondetect reported value = NA
Maximum nondetect reported value = NA
CWQCC surface water standard = 1.00E+01 pCi/L
Background M2SD = 7.89E+00 pCi/L
Practical quantitation limit (PQL) = 6.85E-01 pCi/L

Notes:
- Data presented on the figure represent the most recent surface water analyte result for samples collected between 01/01/2000 and 07/31/2005.
- See Table 5.6 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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State Plane Coordinate Projection
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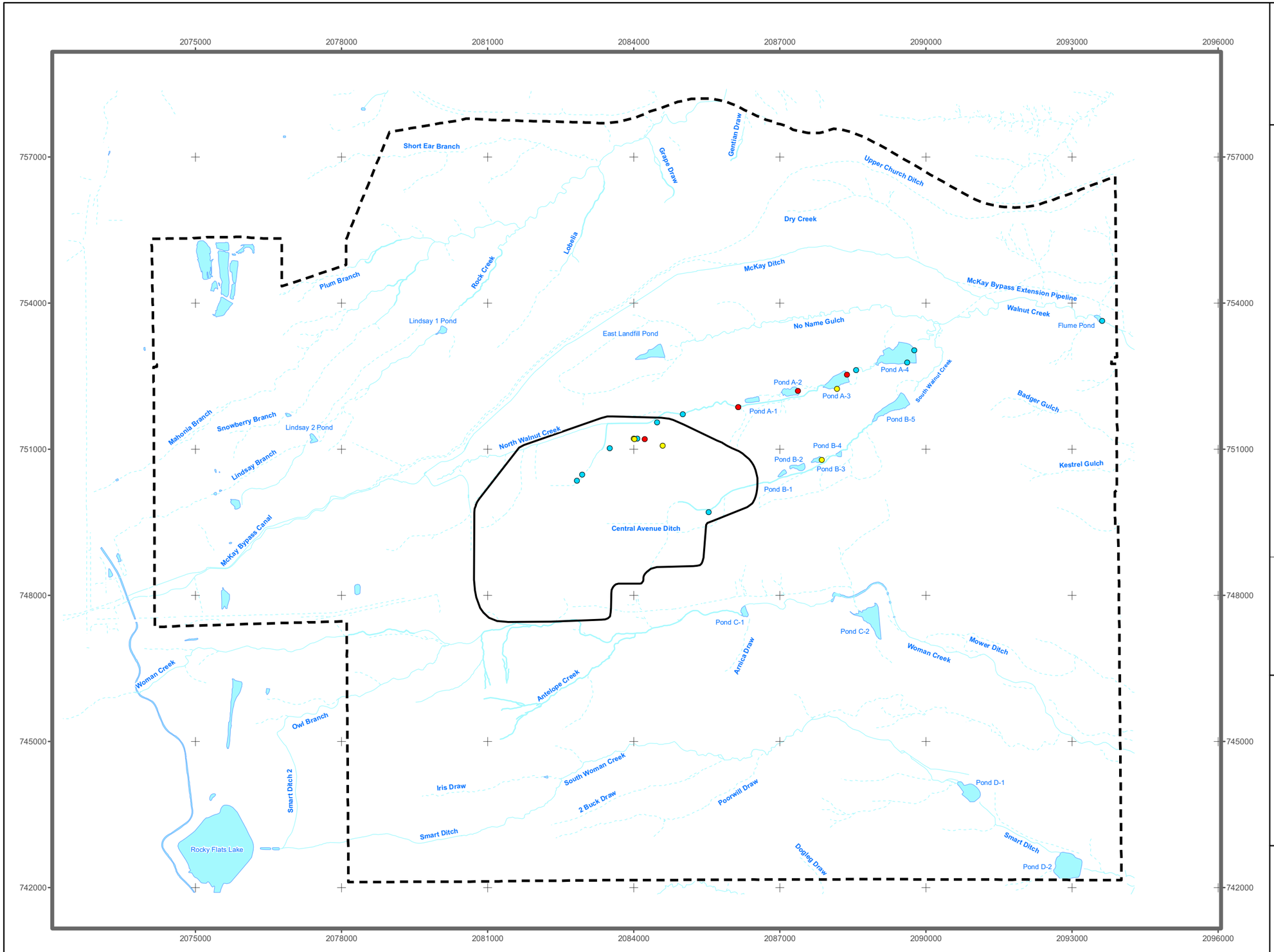
Figure 5.22

Nitrate/Nitrite (as N) Concentrations in Surface Water



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- ● > Surface Water Standard
- ● > Background M2SD and <= Surface Water Standard
- ● Detected and <= Background M2SD
- ● Not detected

Minimum nondetect reported value = 5.00E+01 ug/L
Maximum nondetect reported value = 5.00E+01 ug/L
CWQCC surface water standard = 1.00E+04 ug/L
Background M2SD = 3.48E+03 ug/L
Practical quantitation limit (PQL) = 5.00E+01 ug/L

Notes:
- Data presented on the figure represent the most recent surface water analyte result for samples collected between 01/01/2000 and 07/31/2005.
- See Table 5.6 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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State Plane Coordinate Projection
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Datum: NAD 27

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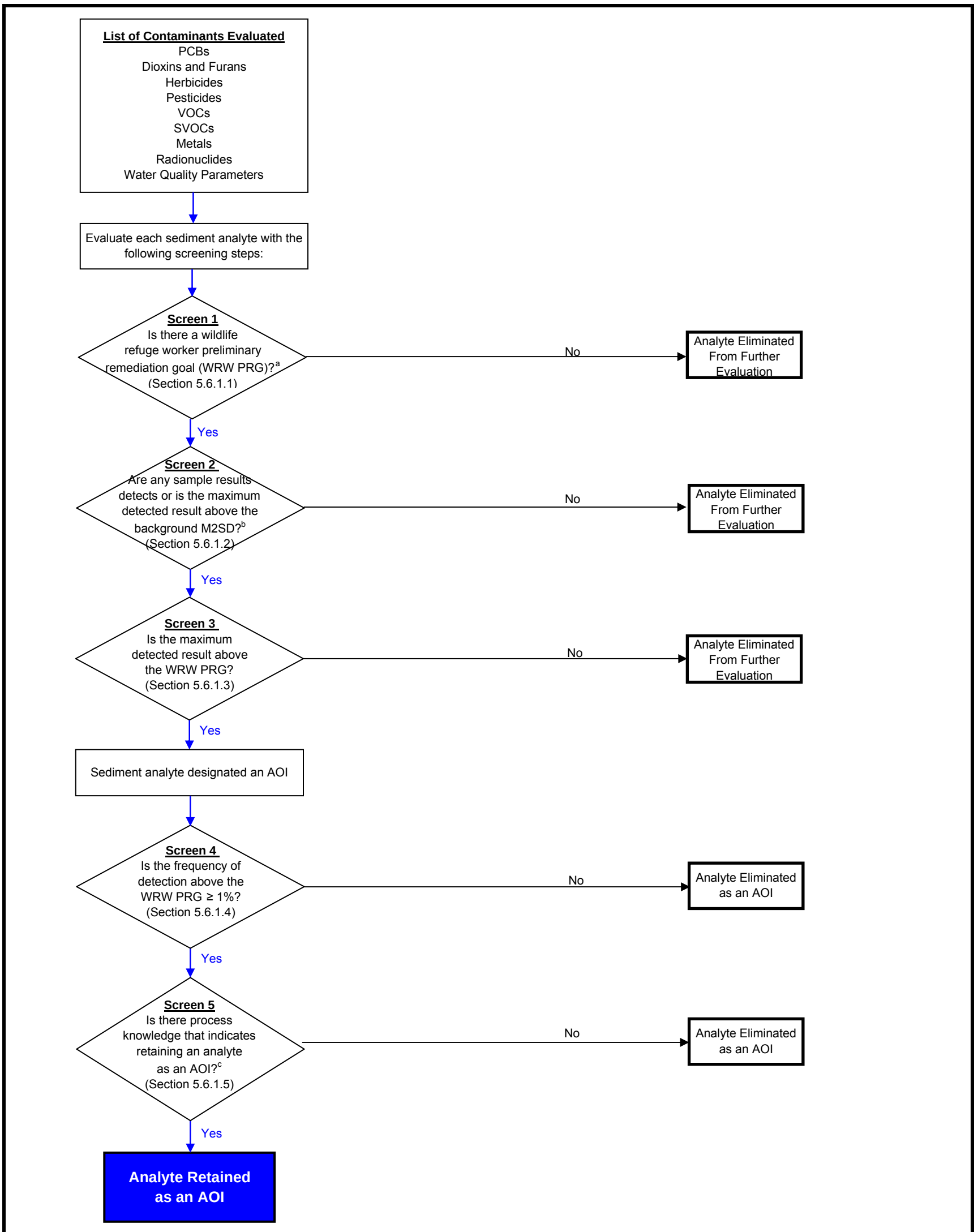
Figure 5.23
Sediment AOI Screening Process



Notes:

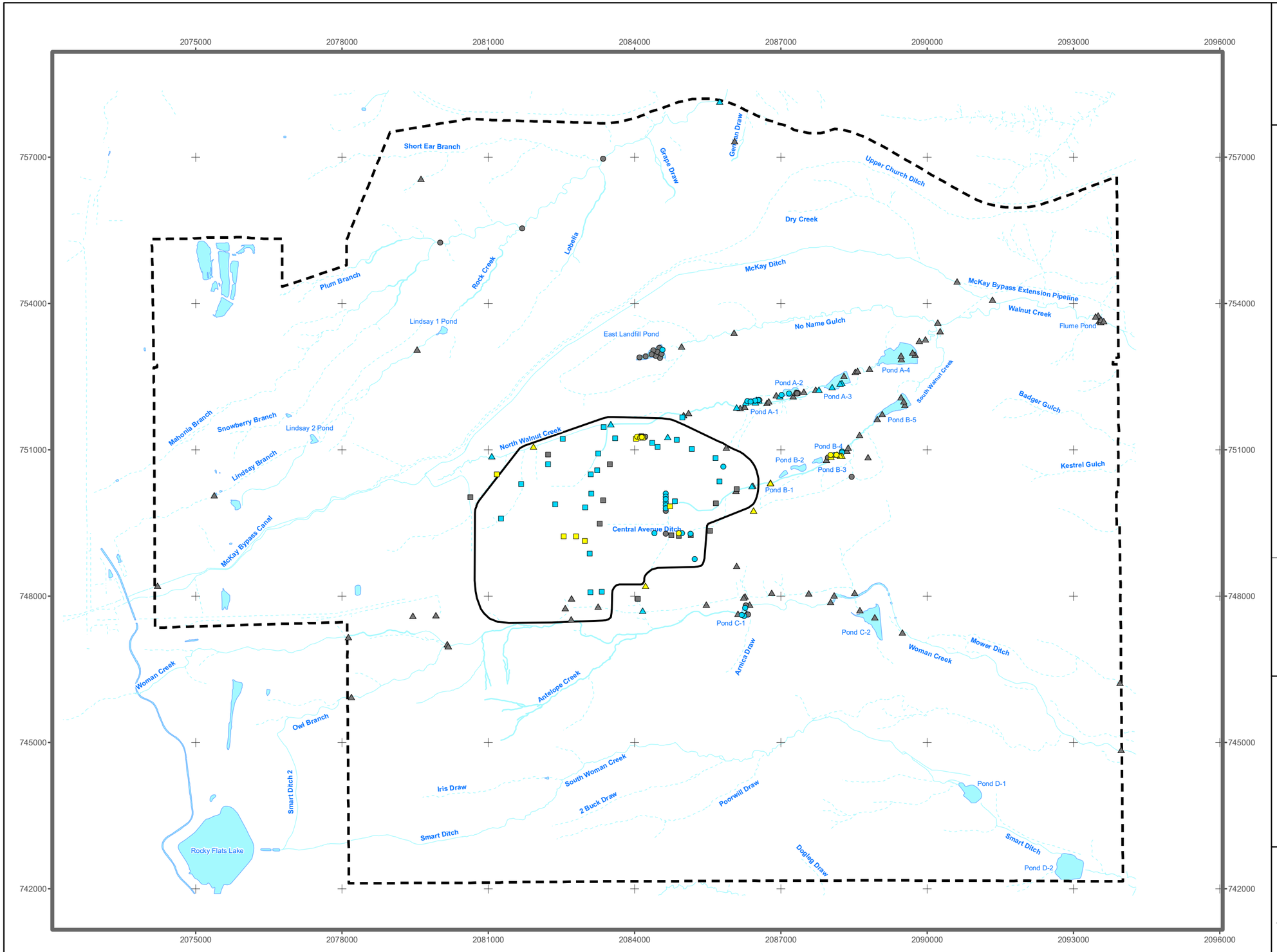
[a]Human health WRW PRG is based on a target excess carcinogenic risk of 1×10^{-6} or a hazard quotient (HQ) of 0.1.

[b]Background mean + two standard deviation (M2SD) values used to evaluate sediment nature and extent were developed as part of the Comprehensive Risk Assessment (DOE 2005). For constituents (organic compounds, some inorganic, and some radionuclides) that do not have background values, it was assumed that detection of these constituents indicates their presence in the environment.

[c]DOE recognizes that process knowledge at RFETS is not perfectly known. However, process knowledge alone is not used to retain or eliminate a constituent as an AOI. Other analyte criteria such as its areal distribution relative to RFETS activities, its proximity to contaminant sources, accelerated actions performed to remove contaminant source(s), and its natural occurrence and distribution in the environment are also considered when evaluating whether to retain or eliminate a constituent as an AOI.

Figure 5.24

Benzo(a)pyrene Concentrations in Sediment



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- >= 10X WRW PRG
- >= WRW PRG and < 10X WRW PRG
- Not applicable
- Detected and < WRW PRG
- Not detected

Minimum nondetect reported value = 3.30E+02 ug/kg
Maximum nondetect reported value = 3.60E+03 ug/kg
Background M2SD = NA
WRW PRG = 3.79E+02 ug/kg

Notes:
- Data presented on the figure represent the most recent sediment analyte result for samples collected between 06/28/1991 and 07/31/2005.
- See Table 5.18 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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Scale 1:24,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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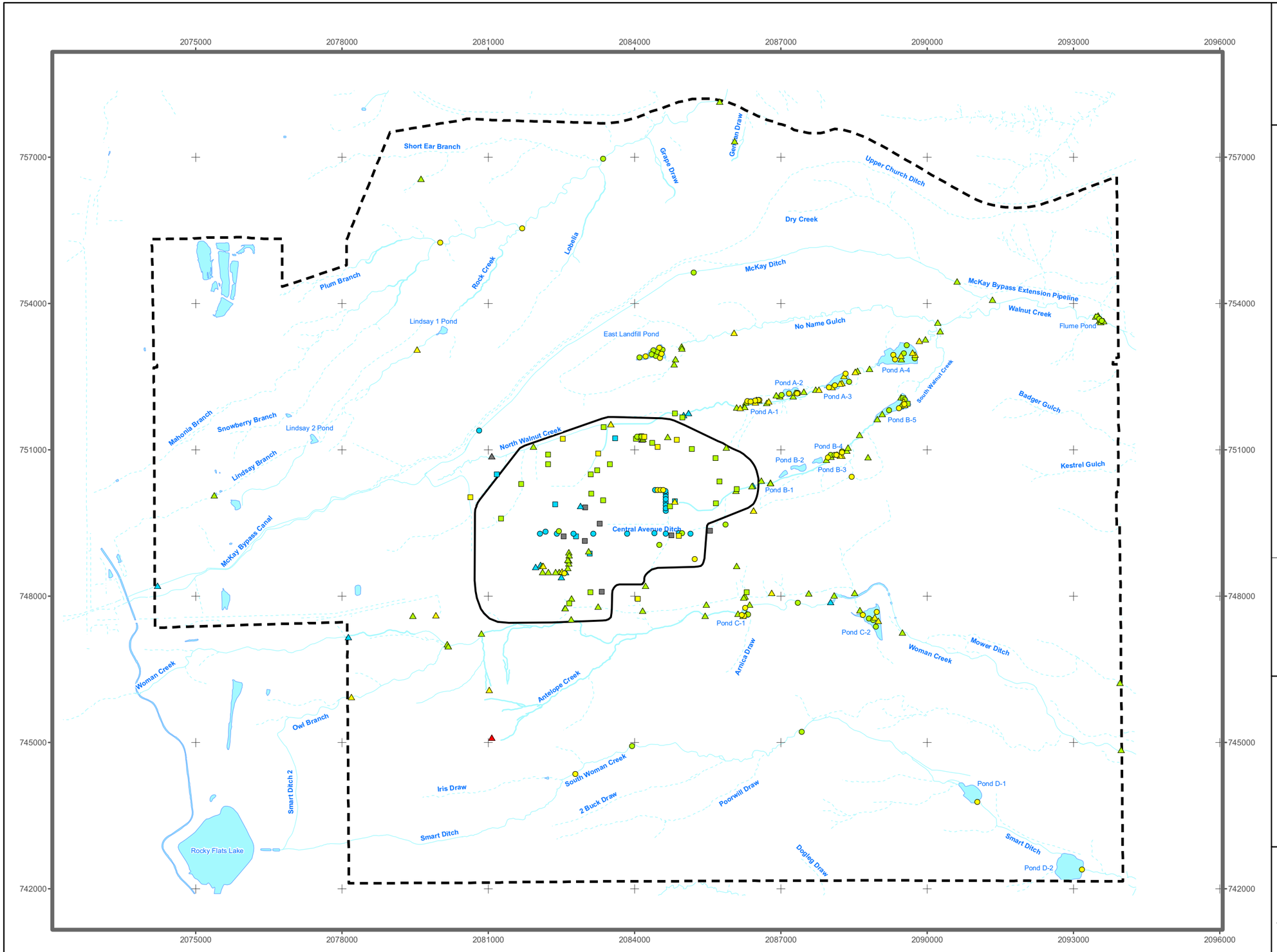
Figure 5.25

Arsenic Concentrations in Sediment



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- >= 10X WRW PRG
- >= Background M2SD and < 10X WRW PRG
- >= WRW PRG and < Background M2SD
- Detected and < WRW PRG
- Not detected

Minimum nondetect reported value = 4.63E+02 ug/kg
Maximum nondetect reported value = 4.80E+03 ug/kg
Background M2SD = 6.26E+03 ug/kg
WRW PRG = 2.41E+03 ug/kg

Notes:
- Data presented on the figure represent the most recent sediment analyte result for samples collected between 06/28/1991 and 07/31/2005.
- See Table 5.18 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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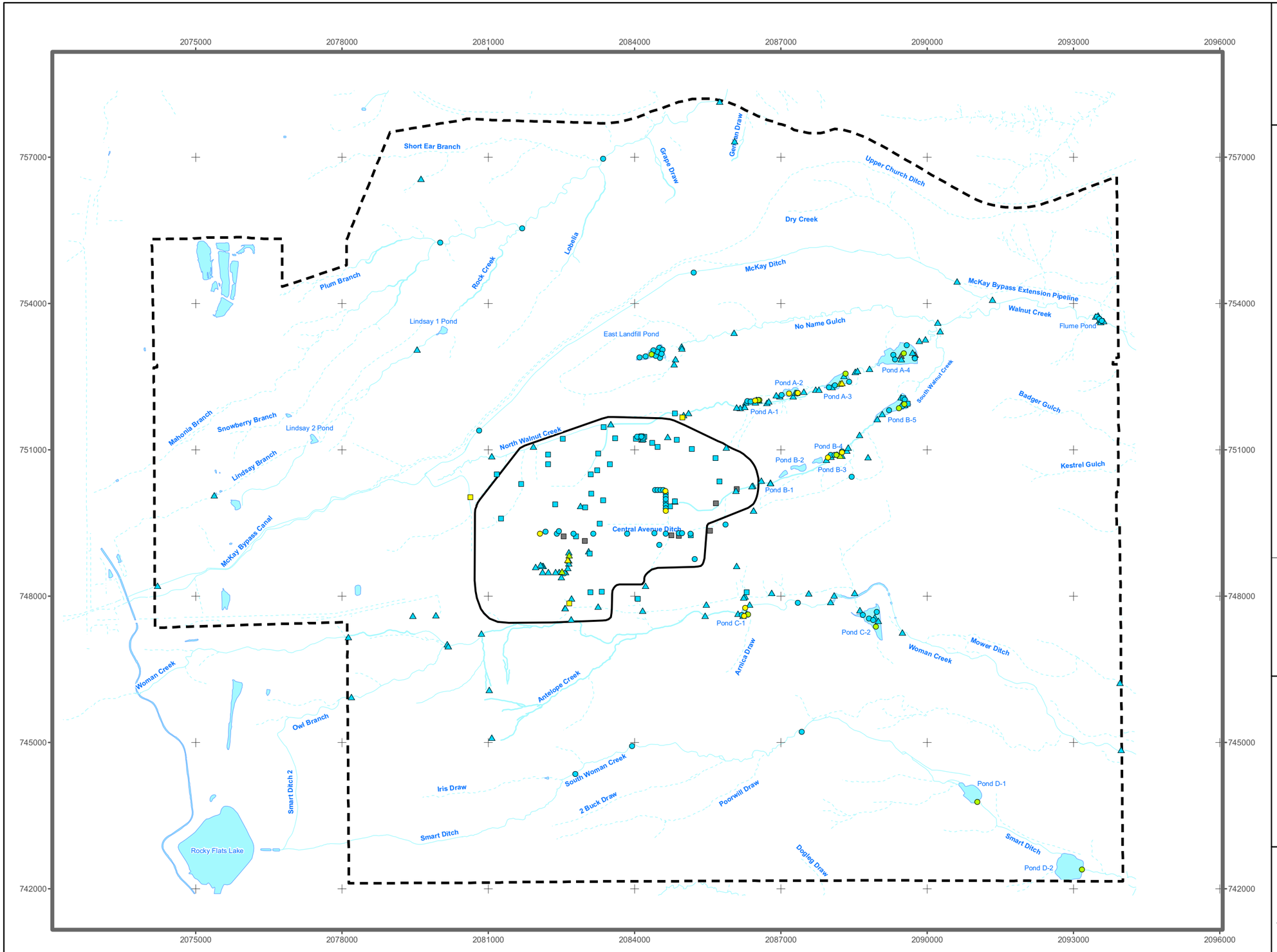
Figure 5.26

Chromium Concentrations in Sediment



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- >= 10X WRW PRG
- >= WRW PRG and < 10X WRW PRG
- >= Background M2SD and < WRW PRG
- Detected and < Background M2SD
- Not detected

Minimum nondetect reported value = 1.20E+03 ug/kg
Maximum nondetect reported value = 2.00E+04 ug/kg
Background M2SD = 2.45E+04 ug/kg
WRW PRG = 2.84E+04 ug/kg

Notes:
- Data presented on the figure represent the most recent sediment analyte result for samples collected between 06/28/1991 and 07/31/2005.
- See Table 5.18 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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Scale 1:24,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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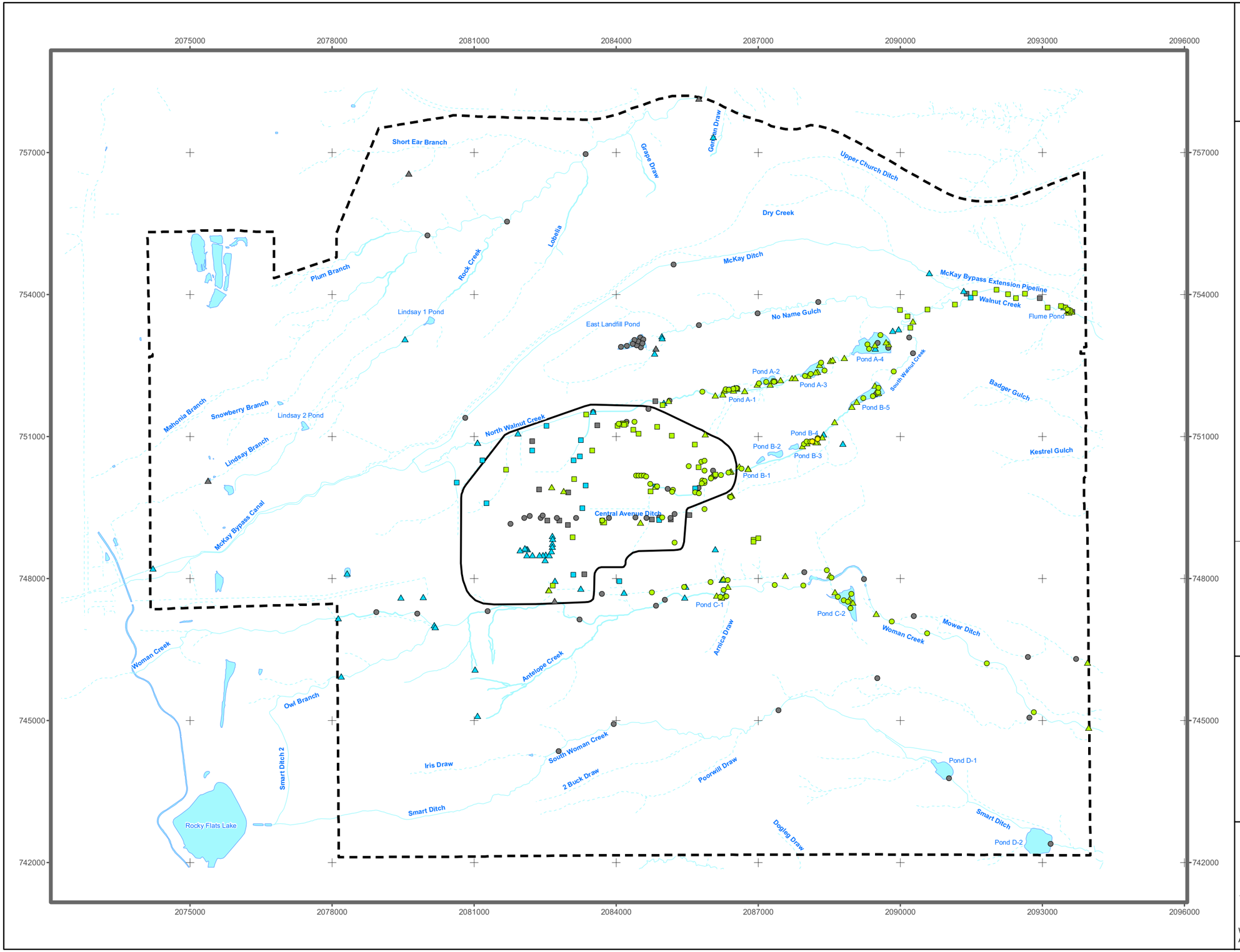
Figure 5.27

Americium-241 Concentrations in Sediment



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- >= 10X WRW PRG
- >= WRW PRG and < 10X WRW PRG
- >= Background M2SD and < WRW PRG
- Detected and < Background M2SD
- Not detected

Minimum nondetect reported value = -3.70E-02 pCi/g
Maximum nondetect reported value = 1.64E-01 pCi/g
Background M2SD = 4.27E-02 pCi/g
WRW PRG = 7.69E+00 pCi/g

Notes:
- Data presented on the figure represent the most recent sediment analyte result for samples collected between 06/28/1991 and 07/31/2005.
- See Table 5.18 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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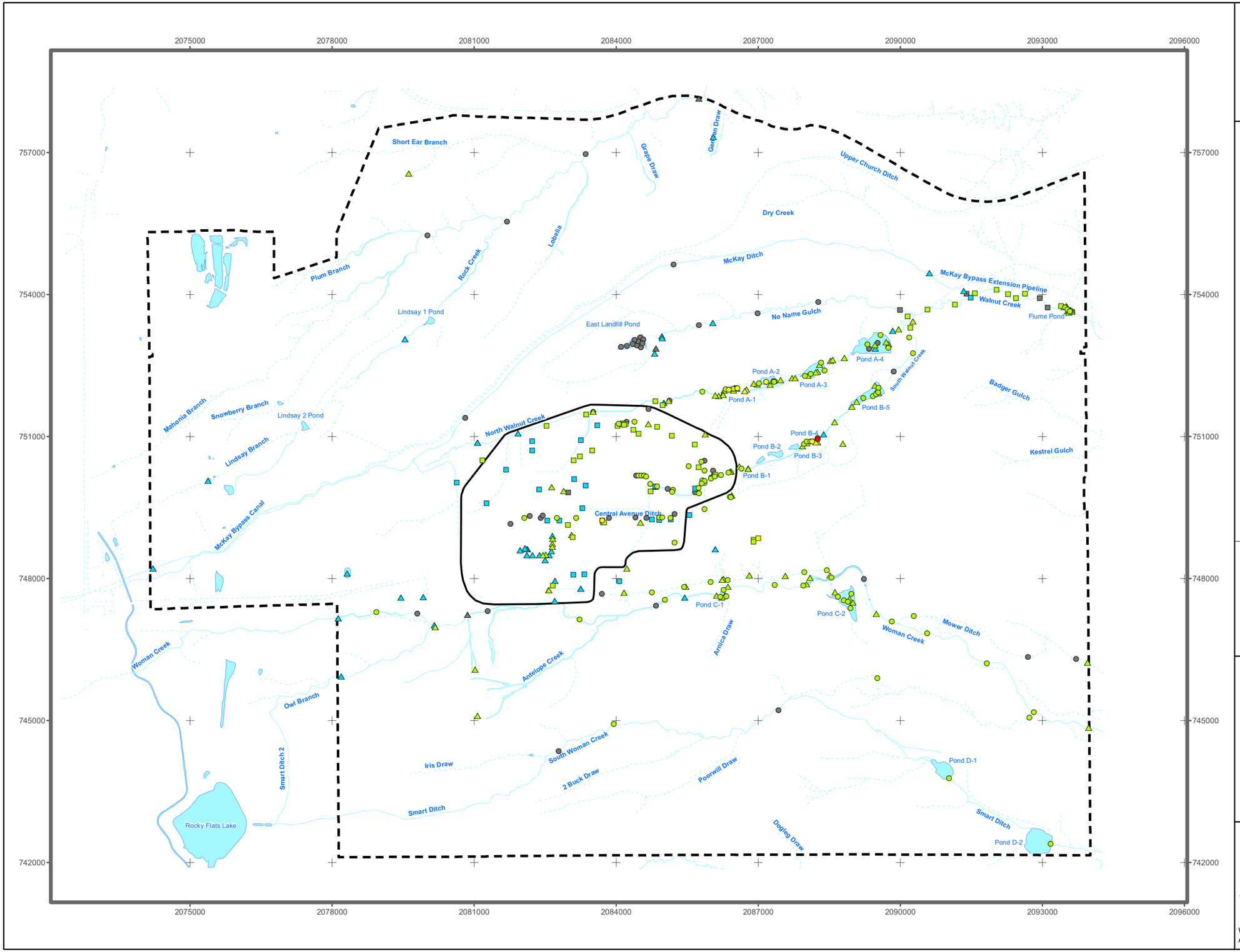
Figure 5.28

Plutonium-239/240 Concentrations in Sediment



KEY

- ○ Sample collected since January 1, 2000
- □ Sample collected between January 1, 1995 and December 31, 1999
- △ Sample collected between June 28, 1991 and December 31, 1994
- >= 10X WRW PRG
- >= WRW PRG and < 10X WRW PRG
- >= Background M2SD and < WRW PRG
- Detected and < Background M2SD
- Not detected

Minimum nondetect reported value = -1.60E-02 pCi/g
Maximum nondetect reported value = 1.92E-01 pCi/g
Background M2SD = 5.09E-02 pCi/g
WRW PRG = 9.80E+00 pCi/g

Notes:
- Data presented on the figure represent the most recent sediment analyte result for samples collected between 06/28/1991 and 07/31/2005.
- See Table 5.18 for additional information.

Standard Map Features

- IA OU boundary
- Pond
- Perennial stream
- Intermittent stream
- Ephemeral stream
- Site boundary

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State Plane Coordinate Projection
Colorado Central Zone
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RCRA FACILITY INVESTIGATION – REMEDIAL INVESTIGATION/ CORRECTIVE MEASURES STUDY – FEASIBILITY STUDY REPORT

NATURE AND EXTENT OF SURFACE WATER AND SEDIMENT CONTAMINATION

SECTION 5.0: ATTACHMENT 1

CD ROM, Surface Water Data and Figures

June 2006